

To: INCITS Technical Committee T10

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Subject: SPC-4: Self Describing Command Timeouts

1. Revisions

1. Incorporated feedback received from Rob Elliott on July 21, 2005

2. Introduction

The SMC working group has given me an action to create a method to describe the timeout values for each command. I believe this is a more general issue than SMC and belongs in SPC.

3. Proposal

Add the following section to Vital Product Data.

7.6.11 Command Timeouts VPD page

The Command Timeouts VPD page provides the means to retrieve timeout information for commands supported by the logical unit. The values provided in this VPD page are based on the time from the start of processing the command, to its reported completion. Since application clients are concerned with the time from the command being issued, to its reported completion, it should be noted that this overall time may be affected by fabric congestion or currently processing operations (e.g. A prior command was issued with the Immediate bit set in the CDB, Multiple concurrent commands with queueing are processing, multi-initiator configurations without reservations, manual unloads, power-on self tests, commands issued shortly after certain aborted commands, commands which force flushes when unwritten write data is in the buffer). For commands that require a change in power condition (see 7.4.12), this time does not include the power condition transition time (e.g., the time to spinup rotating media).

TABLE 317 - Command Timeouts VPD Page

Byte	7	6	5	4	3	2	1	0
0	Peripheral Qualifier (000b)			Peripheral Device Type				
1	Page Code (xxh)							
2	MSB		Page Length (n-3)					LSB
3								
Command Timeouts Descriptors								

TABLE 317 - Command Timeouts VPD Page

Byte	7	6	5	4	3	2	1	0
4 :	Command Timeouts Descriptor (first)							
	:							
: n	Command Timeouts Descriptor (last)							

The command timeouts descriptor is described in Table 318

TABLE 318 - Command Timeouts Descriptor

Byte	7	6	5	4	3	2	1	0
0	DESCRIPTOR TYPE							
1	Reserved							
2	MSB	Descriptor Length (m - 3)						LSB
3								
Descriptors								
4 :	Descriptor (first)							
	:							
: m	Descriptor (last)							

The descriptor type field is defined in Table 319.

TABLE 319. Descriptor Type definition

Code	Name	Description
00h	Default - Medium Access	This is the value to be used for all medium access commands not specified in this VPD page.
01h	Default - Non Medium Access	This is the value to be used for all non-medium access commands not specified in this VPD page.
02h	Default - Buffer Access	This is the value to be used for all Read Buffer and Write Buffer modes and buffer ID's not specified in this VPD page.
03h	Default - Diagnostics	This is the value to be used for all Send Diagnostic commands with a Page Code and Page Code Specific combination not specified in this VPD page.
04h	Default - Mode Select	This is the value to be used for all Mode Select commands of Page Codes not specified in this VPD page.

TABLE 319. Descriptor Type definition

Code	Name	Description
05h	Specific Command	This is the value to be used for the command specified by the OPERATION CODE/SERVICE ACTION combination.
06h	Specific Buffer Access	This is the value to be used for all Read Buffer and Write Buffer modes and buffer ID's not specified in this VPD page.
07h	Specific Diagnostics	This is the value to be used for all Send Diagnostic commands with a Page Code and Page Code Specific combination not specified in this VPD page.
08h	Specific Mode Select	This is the value to be used for all Mode Select commands of Page Codes not specified in this VPD page.
09h - 7Fh	Reserved	
80h - FFh	Vendor-Specific	

7.6.11.1 Timeout Descriptor

The timeout descriptor is described in Table 320

TABLE 320 - Timeout Descriptor

Byte	7	6	5	4	3	2	1	0
0	Reserved for Command Set Specific Definition							
1	MSB	COMMAND TIMEOUT - NOMINAL						LSB
3								
4	MSB	COMMAND TIMEOUT - ERROR RECOVERY PROCEDURE						LSB
7								

The command timeout - nominal field specifies the typical amount of time in seconds required to process the command specified by the CDB OPERATION CODE and CDB SERVICE ACTION fields. A non-zero value in the COMMAND TIMEOUT - NOMINAL field is the amount of time after which the application client may consider that the device server is engaged in error recovery procedures. A value of zero in the COMMAND TIMEOUT - NOMINAL field indicates that no time is being specified. The value specified in the COMMAND TIMEOUT - NOMINAL field may include time required for typical error recovery procedures expected to occur on a regular basis.

The command timeout - error recovery procedure field specifies the maximum amount of time in seconds required to process the command specified by the CDB OPERATION CODE and CDB SERVICE ACTION fields. The value specified includes time required to engage in extensive error recovery procedures. A non-zero value in the COMMAND TIMEOUT - ERROR RECOVERY PROCEDURE field is the amount of time in seconds the application client should wait prior to aborting the command. A value of zero in the COMMAND TIMEOUT - ERROR RECOVERY PROCEDURE field indicates that no time is being specified.

7.6.11.2 Default - Medium Access Descriptor

The Default - Medium Access descriptor is described in Table 321

TABLE 321 - Default - Medium Access descriptor

Byte	7	6	5	4	3	2	1	0
0 : 7	Timeout Descriptor							

For a definition of the Timeout Descriptor See “Timeout Descriptor” on page 3.

7.6.11.3 Default - Non Medium Access

The Default - Non Medium Access descriptor is described in Table 322

TABLE 322 - Default - Non Medium Access descriptor

Byte	7	6	5	4	3	2	1	0
0 : 7	Timeout Descriptor							

For a definition of the Timeout Descriptor See “Timeout Descriptor” on page 3.

7.6.11.4 Default - Buffer Access

The Default - Buffer Access descriptor is described in Table 322

TABLE 323 - Default - Buffer Access descriptor

Byte	7	6	5	4	3	2	1	0
0 : 7	Timeout Descriptor							

For a definition of the Timeout Descriptor See “Timeout Descriptor” on page 3.

7.6.11.5 Default - Diagnostics

The Default - Diagnostics descriptor is described in Table 322

TABLE 324 - Default - Diagnostics descriptor

Byte	7	6	5	4	3	2	1	0
0 : 7	Timeout Descriptor							

For a definition of the Timeout Descriptor See “Timeout Descriptor” on page 3.

7.6.11.6 Default - Mode Select

The Default - Mode Select descriptor is described in Table 322

TABLE 325 - Default - Mode Select descriptor

Byte	7	6	5	4	3	2	1	0
0 : 7	Timeout Descriptor							

For a definition of the Timeout Descriptor See “Timeout Descriptor” on page 3.

7.6.11.7 Specific Command

The specific command descriptor is described in Table 321

TABLE 326 - Specific Commands Descriptor

Byte	7	6	5	4	3	2	1	0
0	Reserved							SERACTV
1	OPERATION CODE							
2	MSB	SERVICE ACTION						LSB
3								
4 : 11	Timeout Descriptor							

The service action valid (SERACTV) bit set to one indicates that the SERVICE ACTION field is valid. The SERACTV bit set to zero indicates the SERVICE ACTION field is not valid and shall be ignored.

The operation code field is the OPERATION CODE field of the CDB for the command being specified (see SAM-3).

The service action field is the SERVICE ACTION field of the CDB for the command being specified (see SAM-3). If the command being specified does not have a SERVICE ACTION field this field shall be set to zero.

For a definition of the Timeout Descriptor See “Timeout Descriptor” on page 3.

7.6.11.8 Specific Buffer Access

The Specific Buffer Access descriptor is described in Table 321

TABLE 327 - Specific Buffer Access Descriptor

Byte	7	6	5	4	3	2	1	0
0	MODE							
1	PAGE CODE							
2	Reserved							
3	Reserved							
4 : 11	Timeout Descriptor							

The mode field contains the value of the MODE field in the Write Buffer command (see 6.35)

The page code field contains the value of the PAGE CODE field in the Write Buffer command (see 6.35)

For a definition of the Timeout Descriptor See “Timeout Descriptor” on page 3.

7.6.11.9 Specific Diagnostics

The Specific Diagnostic descriptor is described in Table 321

TABLE 328 - Specific Diagnostic descriptor

Byte	7	6	5	4	3	2	1	0
0	PAGE CODE							
1	PAGE CODE SPECIFIC							
2	Reserved							SELFTEST
3	Reserved							
4 : 11	Timeout Descriptor							

The page code field is the value of the PAGE CODE field of the Diagnostic page (see 7.1.1).

The page code specific field is the value of the PAGE CODE SPECIFIC field of the Diagnostic page (see 7.1.1).

The SelfTest bit is the value of the SELFTEST bit of the Send Diagnostic command (see 6.28).
For a definition of the Timeout Descriptor See “Timeout Descriptor” on page 3.

7.6.11.10 Specific Mode Select

The Specific Mode Select descriptor is described in Table 321

TABLE 329 - Specific Diagnostic descriptor

Byte	7	6	5	4	3	2	1	0
0	PAGE CODE							
1	SUBPAGE CODE							
2	Reserved							
3	Reserved							
4 : 11	Timeout Descriptor							

The page code field contains the value of the PAGE CODE field of the mode page (see 7.4.5)

The subpage code field contains the value of the SUBPAGE CODE field of the mode page (see 7.4.5)

For a definition of the Timeout Descriptor See “Timeout Descriptor” on page 3.