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**To:** T10 SAS Protocol Working Group  
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**Subject:** SPC-4, Combinations of bits and fields in the LOG SELECT CDB and log parameters

## 1 Related documents

04-389r6, SPC-4: Log Parameter Subpages, Kevin Butt, IBM  
SPC-3 r22a

## 2 Introduction

While going through Kevin's proposal and looking closely at SPC-3, I had difficulty comprehending the meaning of the combinations of bits in the LOG SELECT CDB and in the log parameters. To help my understanding, I made several very large tables trying to list every possible combination of interrelated bits and fields. Then I reduced the large tables to three much smaller tables that I thought contained all of the possibilities.

## 3 Proposal

After significant review by and discussion with George Penokie of IBM, the following are the tables that evolved during this exercise. Table 1 shows all combinations of the relevant values in the LOG SELECT CDB (PCR, SP, PC and PARAMETER LIST LENGTH). Table 2 shows the relationship between PCR and SP in the CDB and DS in the log parameter (i.e., when PARAMETER LIST LENGTH is > 0000h). Table 3 shows the relationship between PC in the CDB and LP and LBIN in the log parameter (also when PARAMETER LIST LENGTH is > 0000h). Once the CAP working group agrees that the content of these tables is correct, I intend to construct another proposal that will show how to incorporate these tables into the draft standard.

Table 1 — Meaning for all combinations of PCR, SP, and PC when PARAMETER LIST LENGTH = 0000h

PCR	SP	PC	Description
0b	0b	0xb	This is not an error. The device server shall make no change to any current threshold values or any current cumulative values and shall not save any values to non-volatile media.
0b	0b	10b	The device server shall set all current threshold values to the vendor specific default threshold values <sup>a</sup> and shall not save any values to non-volatile media.
0b	0b	11b	The device server shall set all current cumulative values to the vendor specific default cumulative values <sup>a</sup> and shall not save any values to non-volatile media.
0b	1b	00b	The device server shall make no change to any current threshold values and shall save all current threshold values to non-volatile media.
0b	1b	01b	The device server shall make no change to any current cumulative values and shall save all current cumulative values to non-volatile media.
0b	1b	10b	The device server shall set all current cumulative values to the vendor specific default cumulative values <sup>a</sup> and shall not save any values to non-volatile media.
0b	1b	11b	The device server shall set all current threshold values to the vendor specific default threshold values <sup>a</sup> and shall not save any values to non-volatile media.
1b	0b	xx	The device server: 1) shall set all current threshold values to the vendor specific default threshold values <sup>a</sup> ; 2) shall set all current cumulative values to the vendor specific default cumulative values <sup>a</sup> ; and 3) shall not save any values to non-volatile media.
1b	1b	00b	The device server: 1) shall save all current threshold values to non-volatile media; 2) shall set all current threshold values to the vendor specific default threshold values <sup>a</sup> ; and 3) shall set all current cumulative values to the vendor specific default cumulative values <sup>a</sup> .
1b	1b	01b	The device server: 1) shall save all current cumulative values to non-volatile media; 2) shall set all current threshold values to the vendor specific default threshold values <sup>a</sup> ; and 3) shall set all current cumulative values to the vendor specific default cumulative values <sup>a</sup> .
1b	1b	1xb	The device server: 1) shall set all current threshold values to the vendor specific default threshold values <sup>a</sup> ; 2) shall set all current cumulative values to the vendor specific default cumulative values <sup>a</sup> ; and 3) shall not save any values to non-volatile media.
Notes -			
<sup>a</sup> Vendor specific default threshold values and vendor specific default cumulative values may be zero.			

**Table 2 — Meaning for all combinations of PCR, SP, and DS when PARAMETER LIST LENGTH > 0000h**

PCR	SP	DS	Description
0b	0b	xb	The device server shall set the specified values <sup>a</sup> to the values in the parameter list and shall not save any values to non-volatile media.
0b	1b	0b	The device server shall set the specified values <sup>a</sup> to the values in the parameter list and shall save the specified values <sup>a</sup> in the parameter list to non-volatile media.
0b	1b	1b	The device server shall set the specified values <sup>a</sup> to the values in the parameter list and shall not save any values to non-volatile media.
1b	xb	xb	The device server shall terminate the command with CHECK CONDITION status, with the sense key set to ILLEGAL REQUEST, and the additional sense code set to INVALID FIELD IN CDB.

Notes -

<sup>a</sup> The specified values are determined by the values in the PC field, the LP bit, and the LBIN bit (see table 3).**Table 3 — Values specified by the PC field, LP bit, and LBIN bit when the PCR bit is set to zero and the value in the PARAMETER LIST LENGTH field is > 0000h**

LP <sup>a</sup>	LBIN <sup>a</sup>	PC <sup>b</sup>	Description
0b	xb	00b	The specified values are current threshold values.
0b	xb	01b	The specified values are current cumulative values.
0b	xb	10b	The specified values are default threshold values.
0b	xb	11b	The specified values are default cumulative values.
1b	0b	xxb	The specified values are ASCII data.
1b	1b	xxb	The specified values are binary data.

Notes -

<sup>a</sup> The LP bit and the LBIN bit are contained in the log parameter and are not present when the PARAMETER LIST LENGTH field is 0000h.<sup>b</sup> When the LP bit is set to one, the specified values are neither threshold nor cumulative data, and the content of the PC field is ignored.