

To: X3T9.2 Committee Membership
From: Edward A. Gardner, Digital Equipment Corporation
Subject: SBP Command Block CDB Alignment

SBP command blocks have been laid out with the intent of aligning all data items on natural boundaries. However, the fields within a SCSI-2 CDB are not aligned. Thus aligning the CDB within the command block results in the internal CDB fields being misaligned. For example, consider a 12-byte CDB embedded within an SBP command block. The CDB is shown in bold. Note that the Logical Block Address and Transfer Length fields are misaligned.

Byte	0	1	2	3
0	Next Command Address (MSQ)			
4	Next Command Address (LSQ)			
8	This Command Address (MSQ)			
12	This Command Address (LSQ)			
16	Reserved		LUN	
20	Codes		Flags	
24	Operation Code	Reserved	Logical Block Address (high)	
28	Logical Block Address (low)		Transfer Length (high)	
32	Transfer Length (low)		Reserved	Control
36	unused			
40	Transfer Length			
44	Control		Reserved	Sense Length
48	Data Buffer Address (MSQ)			
52	Data Buffer Address (LSQ)			
56	Status FIFO Address (MSQ)			
60	Status FIFO Address (LSQ)			
64	Sense Buffer Address (MSQ)			
68	Sense Buffer Address (LSQ)			

At the March 1-2, 1993 SBP working group, a majority of those present voted to live with this (mis-) alignment. The feeling was that no alternate alignments were better. Alternatives considered and rejected included:

1. Changing the CDB.
2. Skewing the CDB field within the command block, e.g.:

20	Codes		Flags	
24	Reserved	Sense Length	Operation Code	Reserved
28	Logical Block Address			
32	Transfer Length			
36	Reserved	Control	unused	
40	unused		(Data Transfer) Control	
44	Transfer Length			

Note that while the 12-byte CDB shown aligns reasonably, other length CDBs do not.

3. Rotating the CDB within the CDB field by two bytes, e.g.:

20	Codes		Flags	
24	Reserved	Control	Operation Code	Reserved
28	Logical Block Address			
32	Transfer Length			
36	unused			
40	Transfer Length			