

memorandum

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T10/04-335r0

To INCITS T10 Committee From Michael Banther, HP Subject WORM Tamper Read Enable

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Revision History

Revision 0 – Initial proposal.

Background

HP and other tape drive vendors wish to include a Write Once Read Multiple (WORM) capability in SSC-3. Previous and on-going proposals seek to add the necessary specifications: [04-211r1](#) and 04-312r0.

Support for WORM operation raises the question, what does a streaming device server do if it detects tampering in a previously written WORM cartridge? This proposal adds a WORM Tamper Read Enable bit that allows the application client to specify the behavior of the device server in this situation.

Proposed changes to SSC-3

2.3 References under development

At the time of publication, the following referenced standards were still under development. For information on the current status of the document, or regarding availability, contact the relevant standards body or other organization as indicated.

ISO/IEC 14776-313, SCSI Primary Commands – 3 standard

ISO/IEC 14776-412, SCSI Architecture Model – 2 standard

ISO/IEC 14776-352, SCSI Media Changer Commands – 2 standard

T10/1729-D, SCSI Primary Commands – 4

8.3.3 Device Configuration mode page

The Device Configuration mode page (see table 62) is used to specify the appropriate sequential-access device configuration.

Table 62 – Device Configuration mode page

Bit Byte	7	6	5	4	3	2	1	0
0	PS	Rsvd	PAGE CODE (10h)					
1	PAGE LENGTH (0Eh)							
2	Rsvd	Obsolete	CAF	ACTIVE FORMAT				
3	ACTIVE PARTITION							
4	WRITE OBJECT BUFFER FULL RATIO							
5	READ OBJECT BUFFER EMPTY RATIO							
6	(MSB)	WRITE DELAY TIME						(LSB)
7	OBR	LOIS	RSMK	AVC	SOCF	ROBO	REW	
9	GAP SIZE							
10	EOD DEFINED			EEG	SEW	SWP	BAML	BAM
11	(MSB)	OBJECT BUFFER SIZE AT EARLY WARNING						(LSB)
12	OBJECT BUFFER SIZE AT EARLY WARNING							
13	OBJECT BUFFER SIZE AT EARLY WARNING							
14	SELECT DATA COMPRESSION ALGORITHM							

on the WORM medium. The device server shall set the sense key to MEDIUM ERROR and the additional sense code to WORM MEDIUM – INTEGRITY CHECK. A WTRE bit set to zero shall have no effect on the completion of an otherwise valid locate, read, read reverse, space, or verify operation when the device contains a non-WORM medium.

A WTRE bit set to one specifies that the device server shall complete with GOOD status an otherwise valid locate, read, read reverse, space, or verify operation regardless of the device server detecting compromised integrity of data stored on the WORM medium. A WTRE bit set to one shall have no effect on the completion of an otherwise valid locate, read, read reverse, space, or verify operation when the device contains a non-WORM medium.



NOTE: An application client should set the WTRE bit to one only for the recovery of data from a WORM medium where the integrity of the stored data has been compromised.

[Editor's Note: IBM will provide a proposal to define WORM, 04-312r0]

Proposed changes to SPC-4

4.5.6 Sense key and sense code definitions

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The additional sense codes and additional sense code qualifiers are defined in table 28.

Table 28 — ASC and ASCQ assignments (part 14 of 15)

ASC	ASCQ	D	T	L	P	W	R	O	M	A	E	B	K	V	F	Description
		D														DIRECT ACCESS BLOCK DEVICE (SBC-2)
			T													SEQUENTIAL ACCESS DEVICE (SSC-2)
				L												PRINTER DEVICE (SSC)
					P											PROCESSOR DEVICE (SPC-2)
						W										WRITE ONCE BLOCK DEVICE (SBC)
							R									CD/DVD DEVICE (MMC-2)
								O								OPTICAL MEMORY BLOCK DEVICE (SBC)
									M							MEDIA CHANGER DEVICE (SMC-2)
										A						STORAGE ARRAY DEVICE (SCC-2)
											E					ENCLOSURE SERVICES DEVICE (SES)
												B				SIMPLIFIED DIRECT-ACCESS DEVICE (RBC)
													K			OPTICAL CARD READER/WRIER DEVICE (OCRW)
														V		AUTOMATION/DRIVE INTERFACE (ADC)
															F	OBJECT-BASED STORAGE (OSD)
30h	0Ch		T													WORM MEDIUM – CANNOT ERASE
30h	0Dh		T													WORM MEDIUM – INTEGRITY CHECK
30h	0Bh		T													WORM MEDIUM – OVERWRITE ATTEMPTED

D.2 Additional Sense Codes

Table D.1 is a numerical order listing of the additional sense codes and the additional sense code qualifiers.

Table D.1 — ASC and ASCQ assignments (part 7 of 15)

ASC	ASCQ	D	T	L	P	W	R	O	M	A	E	B	K	V	F	Description
		D														DIRECT ACCESS BLOCK DEVICE (SBC-2)
			T													SEQUENTIAL ACCESS DEVICE (SSC-2)
				L												PRINTER DEVICE (SSC)
					P											PROCESSOR DEVICE (SPC-2)
						W										WRITE ONCE BLOCK DEVICE (SBC)
							R									CD/DVD DEVICE (MMC-2)
								O								OPTICAL MEMORY BLOCK DEVICE (SBC)
									M							MEDIA CHANGER DEVICE (SMC-2)
										A						STORAGE ARRAY DEVICE (SCC-2)
											E					ENCLOSURE SERVICES DEVICE (SES)
												B				SIMPLIFIED DIRECT-ACCESS DEVICE (RBC)
													K			OPTICAL CARD READER/WRITER DEVICE (OCRW)
														V		AUTOMATION/DRIVE INTERFACE (ADC)
															F	OBJECT-BASED STORAGE (OSD)
30h	0Ch		T													WORM MEDIUM – CANNOT ERASE
30h	0Dh		T													WORM MEDIUM – INTEGRITY CHECK
30h	10h						R									MEDIUM NOT FORMATTED