memorandum

T10/04-211r1

To	From	Subject	Date
INCITS T10 Committee	Michael Banther, HP	WORM support for streaming devices	08 July, 2004

Revision History

Revision 0   Initial proposal

Revision 1   Swapped TapeAlert values to match Quantum's implementation. Removed redundant ASC/ASCQ.

Introduction

The use of Write Once, Read Many (WORM) media in tape drives leads to some new exception conditions not currently catered for by the SCSI command standards. HP proposes adding two new TapeAlert flags and a new ASC/ASCQ value to cover these exceptions.

Proposed Changes to SSC-3

4.2.16.4 WORM TapeAlert flags

Two TapeAlert flags exist to support Write Once Read Multiple (WORM) media:

a) 3Bh, WORM Medium, Integrity Check Failed, and

b) 3Ch, WORM Medium, Overwrite Attempted.

If the device server supports TapeAlert flag 3Bh, it shall set that flag to one upon detecting that the integrity of the medium may be compromised. If the device server supports TapeAlert flag 3Ch, it shall set that flag to one when an application client attempts to overwrite or erase user data.

In addition to the deactivation conditions for all TapeAlert flags (see 4.2.16.2), the device server shall set TapeAlert flags 3Bh and 3Ch to zero upon:

a) Execution of a LOAD command with a LOAD bit of one (see 7.2) that results in a not ready to ready transition or, when both the medium and the device server support MAM, that results in access to medium auxiliary memory only.

b) Execution of an autoload operation (see SPC-3) that results in a not ready to ready transition or, when both the medium and the device server support MAM, that results in access to medium auxiliary memory only.

A.1 TapeAlert log page parameter codes (flags)

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Table A.1 — TapeAlert log page parameter codes (Continued)

Code	Flag	Type	Flag type	Recommended application client message	Probable cause
35h	Tape system area read failure	O	C	The tape system area could not be read successfully at load time: 1. Copy data to another tape cartridge.	Read errors while reading the system area on load.
36h	No start of data	O	C	The start of data could not be found on the tape: 1. Check that you are using the correct format tape. 2. Discard the tape or return the tape to your supplier.	Tape damaged, bulk erased, or incorrect format.
37h	Loading failure	O	C	The operation has failed because the media cannot be loaded and threaded. 1. Remove the cartridge, inspect it as specified in the product manual, and retry the operation. 2. If the problem persists, call the tape drive supplier help line.	The drive is unable to load the media and thread the tape.
38h	Unrecoverable unload failure	O	C	The operation has failed because the medium cannot be unloaded: 1. Do not attempt to extract the tape cartridge. 2. Call the tape driver supplier help line.	The drive is unable to unload the medium.
39h	Automation interface failure	O	C	The tape drive has a problem with the automation interface: 1. Check the power to the automation system. 2. Check the cables and cable connections. 3. Call the supplier help line if problem persists.	The drive has identified an interface fault.
3Ah	Firmware failure	O	W	The tape drive has reset itself due to a detected firmware fault. If problem persists, call the supplier help line.	Firmware bug.
3Bh	WORM Medium – Integrity Check Failed	O	W	The tape drive has detected an inconsistency during the WORM medium integrity checks. Someone may have tampered with the cartridge.	Someone has tampered with the WORM medium.
3Ch	WORM Medium – Overwrite Attempted	O	W	An attempt had been made to overwrite user data on a WORM medium. 1. If a WORM medium was used inadvertently, replace it with a normal data medium. 2. If a WORM medium was used intentionally: Check that the software application is compatible with the WORM medium format you are using. Check that the medium is bar-coded correctly for WORM.	The application software does not recognise the medium as WORM.
3Dh	Rsvd				
3Eh	Rsvd				
3Fh	Rsvd				
40h	Rsvd				
a. Media Recognition System (MRS) is a method where pre-defined stripes are placed at the beginning of the media to identify the media. The MRS stripes are read to determine if the media is of data-grade. Data-grade media should be used in SCSI streaming devices since it is of the required quality and consistency to be used to store data (i.e., audio/video grade media should not be used).					
Key: O = optional M = mandatory C = critical W = warning I = informational					

Proposed Changes to SPC-3

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 30.

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Table 30 — ASC and ASCQ assignments (part 14 of 15)

		D	DIRECT ACCESS BLOCK DEVICE (SBC-2)											Device Column key
		.	T	SEQUENTIAL ACCESS DEVICE (SSC-2)										blank = code not used
		.		L	PRINTER DEVICE (SSC)									not blank = code used
		.			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)
		.			.			.			.			.		
ASC	ASCQ	D	T	L	P	W	R	O	M	A	E	B	K	V	F	Description
									.							
									.							
									.							
0Bh	01h	D	T	L	P	W	R	O	M	A	E	B	K	V	F	WARNING – SPECIFIED TEMPURATURE EXCEEDED
30h	0Ch		T													WORM MEDIUM – OVERWRITE ATTEMPTED
50h	00h		T													WRITE APPEND ERROR
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C.2 Additional Sense Codes

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

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

		D													Device Column key
	.	T													blank = code not used
	.		L												not blank = code used
	.			P											
	.			.	W										
	.				.	R									
	.				.		O								
	.					.		M							
	.					.			A						
	.					.				E					
	.					.					.	B			
	.					.					.		K		
	.					.					.			V	
	.					.					.				.	F
	.			.		.			.			.			.
ASC	ASCQ	D	T	L	P	W	R	O	M	A	E	B	K	V	F	Description

ASC	ASCQ	D	T	L	P	W	R	O	M	A	E	B	K	V	F	Description
							.									
							.									
							.									
30h	0Ah	D	T			W	R	O	M	A	E	B	K			CLEANING REQUEST REJECTED
30h	0Ch		T													WORM MEDIUM – OVERWRITE ATTEMPTED
30h	10h						R									MEDIUM NOT FORMATTED
							.									
							.									
							.									