memorandum

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T10/05-026r2

To	From	Subject	Date
INCITS T10 Committee	Michael Banther, HP	SMC-3: DTE Prevented Medium Removal	10 January 2005

Revision History

Revision 0 – Initial proposal.

Revision 1 – Corrected 'Data Transport element' to 'Data Transfer element'.

Revision 2 – Changes agreed at January, 2005 SMC working group meeting.

Background

At present a standard additional sense code does not exist to explain the failure of a MOVE MEDIUM command when:

1.   The MOVE MEDIUM command specifies a Data Transfer element in the SOURCE ADDRESS; and
2.   The Data Transfer element will not eject the medium due to prior execution of a PREVENT ALLOW MEDIUM REMOVAL command with the PREVENT field set to 01b or 11b.

HP knows of four different additional sense codes used in this situation in existing media changer products:

a.   MEDIA LOAD OR EJECT FAILED which customers generally interpret as a stuck tape;
b.   UNLOAD TAPE FAILURE which customers generally interpret as a stuck tape;
c.   MEDIUM REMOVAL PREVENTED which customers generally interpret as the library not allowing removal; and
d.   A vendor-specific code.

To encourage standard reporting of this situation, HP proposes adding a MEDIUM REMOVAL PREVENTED BY DATA TRANSFER ELEMENT additional sense code to SMC-3 and SPC-4. The proposal also includes some clean-up of existing, but inconsistent, text.

Changes to SMC-3

6.4 EXCHANGE MEDIUM command

The SOURCE ADDRESS, the FIRST DESTINATION ADDRESS, and the SECOND DESTINATION ADDRESS fields may represent a storage element, an import/export element, a data transfer element, or a medium transport element. If an ~~the element~~ address specified has not been assigned to a specific element of the media changer, the ~~logical unit~~ device server shall return CHECK CONDITION status. The sense key shall be ILLEGAL REQUEST and the additional sense code INVALID ELEMENT ADDRESS.

If the SOURCE ADDRESS or the FIRST DESTINATION ADDRESS of an EXCHANGE MEDIUM command represents a data transfer element and a prevention of medium removal condition (see SPC-3) exists within the data transfer device, the device server shall return CHECK CONDITION status and shall set the sense key to ILLEGAL REQUEST and the additional sense code to MEDIUM REMOVAL PREVENTED BY DATA TRANSFER ELEMENT.

An INV1 bit of one specifies that the volume shall be inverted prior to depositing the volume into the FIRST DESTINATION ADDRESS element. Support for this bit set to one is optional.

6.7 MOVE MEDIUM commands

The SOURCE ADDRESS and the DESTINATION ADDRESS fields may represent a storage element, an import/export element, a data transfer element, or a medium transport element. If the address specified has not been assigned to a specific element of the media changer, the device server shall return CHECK CONDITION status. The sense key shall be ILLEGAL REQUEST and the additional sense code INVALID ELEMENT ADDRESS.

If the SOURCE ADDRESS of a MOVE MEDIUM command represents a data transfer element and a prevention of medium removal condition (see SPC-3) exists within the data transfer device, the device server shall return CHECK CONDITION status and shall set the sense key to ILLEGAL REQUEST and the additional sense code to MEDIUM REMOVAL PREVENTED BY DATA TRANSFER ELEMENT.

The Device Capabilities mode page (see 7.3.2), provides a matrix with the supported source element or destination element combinations for the MOVE MEDIUM and MOVE MEDIUM ATTACHED commands.

Proposed Changes to SPC-4

4.5.6 Sense key and sense code definitions

Table 29 — ASC and ASCQ assignments (part 8 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
								.								
								.								
								.								
53h	02h	D	T			W	R	O	M			B	K			MEDIUM REMOVAL PREVENTED
53h	03h								M							MEDIUM REMOVAL PREVENTED BY DATA TRANSFER ELEMENT
3Bh	0Eh	D	T			W	R	O	M			B	K			MEDIUM SOURCE ELEMENT EMPTY
								.								
								.								
								.								

D.2 Additional Sense Codes

Table D.1 — ASC and ASCQ assignments (part 10 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

ASC	ASCQ	D	T	L	P	W	R	O	M	A	E	B	K	V	F	Description
														.		
														.		
														.		
53h	02h	D	T			W	R	O	M			B	K	.		MEDIUM REMOVAL PREVENTED
53h	03h								M							MEDIUM REMOVAL PREVENTED BY DATA TRANSFER ELEMENT
54h	00h				P											SCSI TO HOST SYSTEM INTERFACE FAILURE
														.		
														.		
														.		