T10/06-442r1 SMC-3 Add PREVENT ALLOW MEDIUM REMOVAL command

To: T10 Technical Committee
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Date: 2 January 2007
Subject: T10/06-442 SMC-3 Add PREVENT ALLOW MEDIUM REMOVAL command

Revision History
Revision 0 (18 September 2006): initial revision
Revision 1 (2 January 2007): incorporated changes as discussed in November '06 conference call

Related Documents
06-248r1 – Proposal to remove PREVENT ALLOW MEDIUM REMOVAL (PARM) command from SPC-4
SMC-3 r4 - SCSI Media Changer Commands – 3, revision 4

Overview
Since the PAMR command is removed from SPC-4 (see 06-232r0) a description of this command is required in SMC-3. And add a description for the two medium removal conditions in the model clause of SMC-3: one for the data transfer device and one for the media changer logical unit. And make clear the PAMR command controls only the media changer medium removal condition.

Suggested changes to SMC-3

Change reference to SPC-3 in table 5

Table 5 — Commands for media changers (part 1 of 2)

Command	Operation Code	Type	Reference
PREVENT ALLOW MEDIUM REMOVAL	1Eh	**O**	**6.9**

Add PREVENT ALLOW MEDIUM REMOVAL command to table 6

PREVENT ALLOW MEDIUM REMOVAL (Prevent=0)	Allowed	Allowed	Allowed	Allowed	Allowed
PREVENT ALLOW MEDIUM REMOVAL (Prevent=1)	Conflict	Conflict	Allowed	Conflict	Conflict

Add chapter 5.3 (subsequent chapters move down) in the model clause with a description of media changer medium removal condition and data transfer device medium removal condition

5.3 Medium removal control:

5.3.1 Media changer medium removal condition

The media changer medium removal condition defines the ability for a user to remove media from the media changer device. The media changer medium removal condition is controlled by the PREVENT ALLOW MEDIA REMOVAL command (see 6.9) to the media changer device server. Properties in the Extended Device Capabilities mode page (see 7.3.3) specify specifics about the media changer medium removal condition.

5.3.2 Data transfer device medium removal condition

The data transfer device medium removal condition defines the ability for a media changer to remove media from the data transfer device. The data transfer device medium removal condition is controlled by the PREVENT ALLOW MEDIA REMOVAL command (see SSC-3, or SBC-3) to the data transfer device server.

[Editors note: A property in the Extended Device Capabilities mode page that specifies if moves from DTE are allowed when data transfer device medium removal is prevented may be useful]

Change paragraph in chapter 6.3

…

If the element address specified in the SOURCE ADDRESS or the FIRST DESTINATION ADDRESS field of an EXCHANGE MEDIUM command represents a data transfer element and the data transfer device medium removal is prevented (see 5.3.2)~~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.

Add paragraph in chapter 6.3

When the move prevented to import/export element (MVPRV) bit set is set to one in the Extended Device Capabilities mode page (see 7.3.3) and the element address specified in the DESTINATION ADDRESS or the FIRST DESTINATION ADDRESS field of an EXCHANGE MEDIUM command represents an import export element and the media changer medium removal is prevented (see 5.3.1), 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. When the MVPRV bit is set to zero a move to an import export element shall not depend on the media changer medium removal condition.

Change paragraph in chapter 6.6

…

If the element address specified in the SOURCE ADDRESS field of a MOVE MEDIUM command represents a data transfer element and the data transfer device medium removal is prevented (see 5.3.2)~~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.

Add paragraph in chapter 6.6

When the move prevented to import/export element (MVPRV) bit set is set to one in the Extended Device Capabilities mode page (see 7.3.3) and the element address specified in the DESTINATION ADDRESS field of a MOVE MEDIUM command represents an import export element and the media changer medium removal is prevented (see 5.3.1), 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. When the MVPRV bit is set to zero a move to an import export element shall not depend on the media changer medium removal condition.

Insert chapter 6.9, subsequent chapters move down.

6.9 PREVENT ALLOW MEDIUM REMOVAL command

The PREVENT ALLOW MEDIUM REMOVAL command (see table x) requests ~~that~~ the media changer logical unit to enable or disable~~ the removal of the medium.~~ removal of media from the media changer. The logical unit shall not allow medium removal if any initiator port currently has medium removal prevented.

Table x — PREVENT ALLOW MEDIUM REMOVAL command

Byte \ Bit	7	6	5	4	3	2	1	0
0	OPERATION CODE 1Eh							
1	Reserved							
2	Reserved							
3	Reserved							
4	Reserved							PREVENT
5	CONTROL							

Table x+1 specifies the PREVENT field values and their meanings.

Table x+1 PREVENT field

PREVENT	Description
00	Medium removal shall be allowed.
01	Medium removal shall be prohibited.
10	Obsolete
11	Obsolete

The media changer medium removal prevention ~~of medium removal~~ shall begin when any application client issues a PREVENT ALLOW MEDIUM REMOVAL command with a PREVENT field of 01b (i.e., medium removal prevented). The media changer medium removal prevention~~of medium removal for the logical unit~~ shall terminate after:

a) one of the following occurs for each I_T nexus that previously had medium removal prevented:
   A) receipt of a PREVENT ALLOW MEDIUM REMOVAL command with a PREVENT field of 00b;
   B) an I_T nexus loss; or
b) a power on;
c) a hard reset; or
d) a logical unit reset.

~~If possible, the device server shall perform an synchronize cache operation before terminating the prevention of medium removal.~~ If a persistent reservation or registration is being preempted by a PERSISTENT RESERVE OUT command with PREEMPT AND ABORT service action (see SPC-3), the equivalent of a PREVENT ALLOW MEDIUM REMOVAL command with the PREVENT field set to 00b shall be processed for each I_T nexuses associated with the persistent reservation or registrations being preempted. This allows an application client to override the prevention of medium removal function for an initiator port that is no longer operating correctly.

While the media changer medium removal~~a~~ prevention ~~of medium removal condition~~ is in effect the media changer logical unit shall do one or more of the following:

a) prevent moves with the import/export element as destination element address when the move prevented to import/export element (MVPRV) bit set is set to one in the Extended Device Capabilities mode page (see 7.3.3);
b) secure the media changer door(s) when the lock door (LCKD) bit is set to one in the Extended Device Capabilities mode page; and/or
c) secure the media changer import/export element(s) when the lock import/export element (LCKIE) bit is set to one in the Extended Device Capabilities mode page.