T10/05-078r3 SMC-3 Extended device capabilities proposal

To: T10 Technical Committee
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Subject: T10/05-078r2 SMC-3 Extended device capabilities proposal

Revision History
Revision 0 (22 February 2005): initial revision
Revision 1 (1 May 2005): updated revision (not posted on T10 website)
Revision 2 (20 May 2005): incorporated changes as discussed in May T10 SMC-3 WG
Revision 3 (11 July 2005): incorporated changes as discussed in July T10 SMC-3 WG

Related Documents
SMC-3 r0 - SCSI Media Changer Commands – 3, revision 0

Overview
Media changer driver developers are currently keying from the media changer Product ID in order to set some of the media changer properties. Until now there is no other method to retrieve certain properties from the media changer itself. This proposal will add the missing static properties into a sub page of the Device Capabilities mode sense page.

Suggested Changes to SMC-3
Change Table 31 - Mode page codes:
-    Add Subpage code column
-    Add line: 1Fh, 01h, Extended Device Capabilities, 7.3.3

Page code	Subpage code	Mode page codes	Reference
00h	Not applicable	Vendor-specific (does not require page format)	
01h	00h - FEh	Reserved	
02h	00h	Disconnect-Reconnect	SPC-3
03h - 09h	00h – FEh	Reserved	
0Ah	00h	Control	SPC-3
0Ah	01h	Control Extention	SPC-3
0Bh - 17h	00h – FEh	Reserved	
18h	00h	Protocol Specific LUN	SPC-3
19h	00h	Protocol Specific Port	SPC-3
1Ah	00h	Power Condition	SPC-3
1Bh	00h – FEh	Reserved	
1Ch	00h	Informational Exceptions Control	SPC-3
1Dh	00h	Element Address Assignment	7.3.4
1Eh	00h	Transport Geometry Parameters	7.3.5
1Fh	00h	Device Capabilities	7.3.2
1Fh	01h	Extended Device Capabilities	7.3.3
20h – 3Eh	00h – FEh	Vendor-specific (page format required)	
3Fh	00h	Return all pages (valid only for the MODE SENSE command)	SPC-3
3Fh	FFh	Return all pages and subpages (valid only for the MODE SENSE command)	SPC-3
00h – 3Eh	FFh	Return all subpages (valid only for the MODE SENSE command)	SPC-3

Add the following chapter:
7.3.3 Extended Device Capabilities mode page

The Extended Device Capabilities mode page (see table XX) defines characteristics of the media changer. Independent media changers shall return this page. Attached media changers shall not return this page. This information may be employed by the application client to determine capabilities performed by the media changer.

Table XX – Extended Device Capabilities mode page

Bit / Byte	7	6	5	4	3	2	1	0
0	PS (0)	SPF (1)	PAGE CODE (1Fh)					
1	SUBPAGE CODE (01h)							
2	(MSB)	PAGE LENGTH (10h)						
3								(LSB)
4	Reserved			MVCL	MVOP	USRCL	USROP	IEST
5	Reserved		DTEDA	RSSTA	MVTRY	IEMGZ	SMGZ	NVSTAT
6	Reserved					TREXC	LCKIE	LCKD
7	Reserved					PDERQ	PMERQ	PEPOS
8	Reserved							UCST
9-19	Reserved							

The parameters savable (PS) bit is only used with the MODE SENSE command. This bit is reserved with the MODE SELECT command. A PS bit of one indicates that the device server is capable of saving the page in a nonvolatile vendor specific location. A PS bit set to zero indicates that the device server is not able to save the page.

A SubPage Format (SPF) bit set to one indicates that the subpage mode page format is being used.

An import/export element state (IEST) bit set to one indicates that the media changer is able to detect medium presence in all import/export elements. An IEST bit set to zero indicates that the media changer is not able to detect medium presence in all import/export elements.

A user control import/export element open (USROP) bit set to one indicates that the media changer requires the operator to manually open a closed import/export element. An USROP bit set to zero indicates that the media changer does not require the operator to manually open a closed import/export element.

A user control import/export element close (USRCL) bit set to one indicates that the media changer requires the operator to manually close an open import/export element. An USRCL bit set to zero indicates that the media changer does not require the operator to manually close an open import/export element.

A move opens import/export element (MVOP) bit set to one indicates that the media changer opens the import/export element for operator access whenever a command is issued to move media with an import/export element as a destination element address. An MVOP bit set to zero indicates that the media changer does not open the import export element for operator access whenever a command is issued to move media with an import/export element as a destination element address.

A move closes import/export element (MVCL) bit set to one indicates that the media changer will close the import/export element whenever a command is issued to move media from an open import/export element. An MVCL bit set to zero indicates that the media changer is unable to move media from an open import/export element.

A nonvolatile status (NVSTAT) bit set to one indicates that the media changer element status persists through a logical unit reset. An NVSTAT bit set to zero indicates that the medium changer element status does not persist through a logical unit reset.

A storage magazine (SMGZ) bit set to one indicates that the media changer uses medium magazines for some storage elements. A SMGZ bit set to zero indicates that the media changer does not use medium magazines for any storage element.

An import/export magazine (IEMGZ) bit set to one indicates that the media changer uses medium magazines for some import/export elements. An IEMGZ bit set to zero indicates that the media changer does not use medium magazines for any import/export element.

A move tray (MV_TRY) bit set to one indicates that the media changer uses removable trays in its elements, which requires the medium to be placed in a tray and the tray moved to the desired position. An MV_TRY bit set to zero indicates that the media changer does not use trays in its elements.

A return to source storage element address (RSSEA) bit set to one indicates that the media changer requires the application client to return the medium to the element address specified in the SOURCE STORAGE ELEMENT ADDRESS field (see 6.10.4). An RSSEA bit set to zero indicates that the application client does not need to return the medium to the element address specified in the SOURCE STORAGE ELEMENT ADDRESS field.

A data transfer element empty on door access (DTEDA) bit set to one indicates that the media changer requires all data transfer elements not contain media before access via the door is possible. A DTEDA bit set to zero indicates that the door may be opened while data transfer elements contain media.

A true exchange capable (TREXC) bit set to one indicates that the media changer allows an EXCHANGE MEDIUM command that has the second destination element address equal to the source element address. A TREXC bit set to zero indicates that the media changer does not allow an EXCHANGE MEDIUM command that has the second destination element address equal to the source element address.

A lock door (LCKD) bit set to one indicates that the PREVENT ALLOW MEDIUM REMOVAL command with the PREVENT bit set to one secures the media changer door(s). An LCKD bit set to zero indicates that the PREVENT ALLOW MEDIUM REMOVAL command with the PREVENT bit set to one does not secure the media changer door(s).

A lock import/export element (LCKIE) bit set to one indicates that the PREVENT ALLOW MEDIUM REMOVAL command with the PREVENT bit set to one secures the media changer import/export element(s). An LCKIE bit set to zero indicates that the PREVENT ALLOW MEDIUM REMOVAL command with the PREVENT bit set to one does not secure the media changer import/export element(s).

An pre-eject position (PEPOS) bit set to one indicates that the media changer requires a POSITION TO ELEMENT command to position the medium transport element to a data transfer element before an eject (see SSC-3). An PEPOS bit set to zero indicates that the media changer does not require a POSITION TO ELEMENT command to position the medium transport element to a data transfer element before an eject.

A pre-mount eject required (PMERQ) bit set to one indicates that the media changer requires the application client to send an explicit command to the data transfer element to extend the drive mechanism before the media changer is able to move the medium to the data transfer element. (e.g. a CD-ROM changer that requires the tray to be presented before the MOVE MEDIUM operation starts). A PMERQ bit set to zero indicates that the application client does not need to send an explicit command to the data transfer element before the media changer is able to move the medium to the data transfer element.

A pre-dismount eject required (PDERQ) bit set to one indicates that the media changer requires the application client to send an explicit command to the data transfer element to eject (see SSC-3) the medium before the media changer is able to move the medium from the data transfer element. A PDERQ bit set to zero indicates that the application client does not need to send an explicit command to the data transfer element to eject the medium before the media changer is able to move the medium from a data transfer element.

An unassigned cleaning storage (UCST) bit set to one indicates that the device server does not assign element addresses to the physical entities that contain cleaning media. These unassigned physical entities are not reported in the READ ELEMENT STATUS data. A UCST bit set to zero indicates that the device server assigns element addresses to physical entities that contain cleaning media.