T10/05-078r0 SMC-3 Extended device capabilities proposal

To: T10 Technical Committee
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Date: 22 February 2005
Subject: T10/05-078r0 SMC-3 Extended device capabilities proposal

Revision History
Revision 0 (22 February 2005): initial revision

Related Documents
smc2r07 - SCSI Media Changer Commands - 2 revision 7

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
All page code and subpage code combinations not shown in this table are reserved.			

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	MV_RTR	MV_EXT	USR_CL	USR_OP	CL_IEP	OP_IEP	IEP_ST
5	Reserved		DRV_EMP	R_ORG_A	MV_TRY	CMGZ	Reserved	NV_STAT
6	Reserved			CL_A_DM	CL_A_INV	CL_SLT	CL_RQ	N_A_CL
7	Reserved				TR_EXC	EXC_CP	INIT_WR	PTE_CP
8	Reserved							
9	Reserved			VOL_ID	VOL_SR	VOL_AS	VOL_UN	VOL_RP
10	Reserved							
11	Reserved					LCK_KP	LCK_IE	LCK_D
12	Reserved							
13	Reserved				DIS_RQ	MT_RQ	PPOS_DR	PPOS_SL
14-19	Reserved							

When using the MODE SENSE command, parameters saveable (PS) bit set to one indicates that the mode page may be saved by the logical unit in a nonvolatile, vendor specific location. A PS bit set to zero indicates that the supported parameters cannot be saved. When using the MODE SELECT command, the PS bit is reserved.

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

Driver Property	Flag name	Value	Description
CHANGER REPORT IEPORT STATE	IEP_ST	1	The medium-changer can determine whether media is present in the IEport
		0	The medium-changer cannot detect media presence in the IEport
CHANGER OPEN IEPORT	OP_IEP	1	The medium-changer can open the IEport by means of the OPEN/CLOSE ELEMENT command
		0	The medium-changer cannot open the IEport by means of the OPEN/CLOSE ELEMENT command
CHANGER CLOSE IEPORT	CL_IEP	1	The medium-changer has the ability to close the IEport by means of the OPEN/CLOSE ELEMENT command
		0	The medium-changer cannot close the IEport by means of the OPEN/CLOSE ELEMENT command
CHANGER IEPORT USER CONTROL OPEN	USR_OP	1	The medium-changer requires the user to manually open a closed IEport
		0	No user operation is required to open a closed IEport

CHANGER IEPORT USER CONTROL CLOSE	USR_CL	1	The medium-changer requires the user to manually close an open IEport
		0	No user operation is required to close a open IEport
CHANGER MOVE EXTENDS IEPORT	MV_EXT	1	The medium-changer will open the IEport automatically whenever a command is issued to move media to an IEport
		0	The IEport remains closed whenever a command is issued to move media to the IEport
CHANGER MOVE RETRACTS IEPORT	MV_RTR	1	The medium-changer will close the IEport automatically whenever a command is issued to move media from an IEport
		0	The medium-changer will not close the IEport whenever a command is issued to move media from an open IEport.
CHANGER STATUS NON VOLATILE	NV_STAT	1	The medium-changer uses non-volatile memory for element status information
		0	The medium changer initializes its element status information at power-on
CHANGER CARTRIDGE MAGAZINE	CMGZ	1	The medium-changer uses cartridge magazines for (some) storage slots
		0	The media changer does not use cartridge magazines
CHANGER SLOT USE TRAYS	MV_TRY	1	The medium-changer uses removable trays in its slots, which require the media to be placed in a tray and the tray moved to the desired position
		0	The medium-changer does not use trays in its slots
CHANGER RTN MEDIA TO ORIGINAL ADDR	R_ORG_A	1	The medium-changer requires media to be returned to its original slot after it has been moved
		0	The medium-changer can return the media to any free location after it has been moved
CHANGER DRIVE EMPTY ON DOOR ACCESS	DRV_EMP	1	The medium-changer requires all data transfer elements to be empty (dismounted) before access via the door is possible
		0	The medium-changer may open the door while the data transfer elements contain media
CHANGER CLEANER OPS NOT SUPPORTED	N_A_CL	1	The medium-changer does not support automatic cleaning of its data transfer element(s)
		0	The medium-changer can clean its data transfer element(s) automatically
CHANGER DRIVE CLEANING REQUIRED	CL_RQ	1	The medium-changer's data transfer element(s) require periodic cleaning, which must be initiated by either the user or an application, and the changer can use its medium transport element to mount a cleaner cartridge in a data transfer element
		0	The user or an application does not need to initiate cleaning of an data transfer element
CHANGER CLEANER SLOT	CL_SLT	1	The medium-changer has an element designated for a cleaner cartridge. The MEDIUM TYPE field in the Read Element Status shall indicate where the cleaning media resides
		0	There is no element designated for a cleaner cartridge.
CHANGER CLEANER ACCESS NOT VALID	CL_A_INV	1	The ACCESS flag in Read Element Status data for a data transfer element is set to zero when the data transfer element contains a cleaning cartridge
		0	The ACCESS flag in Read Element Status data for a data transfer element is set to one when the data transfer element contains a cleaning cartridge
CHANGER CLEANER AUTO DISMOUNT	CL_A_DM	1	The medium-changer will move the cleaner cartridge back into the slot when cleaning has completed
		0	The cleaner cartridge remains in the data transfer element when cleaning is completed
CHANGER POSITION TO ELEMENT	PTE_CP	1	The medium-changer can position the medium transport element to a particular destination. This means that the medium-changer supports the POSITION TO ELEMENT command
		0	The medium-changer does not support the POSITION TO ELEMENT command
CHANGER INIT ELEM STAT WITH RANGE	INIT_WR	1	The medium-changer can initialize elements within a specified range. This means that the medium-changer supports the INITIALIZE ELEMENT STATUS WITH RANGE command

		0	The medium-changer does not support the INITIALIZE ELEMENT STATUS WITH RANGE command
CHANGER EXCHANGE MEDIA	EXC_CP	1	The medium-changer can exchange media between elements. This means that the medium-changer supports the EXCHANGE MEDIUM command
		0	The medium-changer does not support the EXCHANGE MEDIUM command
CHANGER TRUE EXCHANGE CAPABLE	TR_EXC	1	The medium-changer can exchange media between a source and a destination in a single operation
		0	The medium-changer requires a free storage slot in order to complete an exchange media between a source and a destination
CHANGER VOLUME REPLACE	VOL_RP	1	The medium-changer can replace volume information. This means that the medium-changer supports the SEND VOLUME TAG command with a send action code of REPLACE
		0	The medium-changer does not support the SEND VOLUME TAG command with send action code REPLACE
CHANGER VOLUME UNDEFINE	VOL_UN	1	The medium-changer can clear existing volume information. This means that the medium-changer supports the SEND VOLUME TAG command with a send action code of UNDEFINE
		0	The medium-changer does not support the SEND VOLUME TAG command with send action code UNDEFINE
CHANGER VOLUME ASSERT	VOL_AS	1	The medium-changer can verify volume information. This means that the medium-changer supports the SEND VOLUME TAG command with a send action code of ASSERT
		0	The medium-changer does not support the SEND VOLUME TAG command with send action code ASSERT
CHANGER VOLUME SEARCH	VOL_SR	1	The medium-changer can search for volume information. This means that the medium-changer supports the SEND VOLUME TAG command with a send action code of TRANSLATE
		0	The medium-changer does not support the SEND VOLUME TAG command with send action code TRANSLATE
CHANGER VOLUME IDENTIFI-CATION	VOL_ID	1	The medium-changer supports volume identification. This means that the medium-changer supports the SEND VOLUME TAG and REQUEST VOLUME ELEMENT ADDRESS commands
		0	The medium-changer does not support the SEND VOLUME TAG and REQUEST VOLUME ELEMENT ADDRESS commands
LOCK UNLOCK DOOR	LCK_D	1	The medium-changer door can be (un)secured to (allow)prevent media removal
		0	The medium-changer cannot lock the door
LOCK UNLOCK IEPORT	LCK_IE	1	The medium-changer IEport can be (un)secured to (allow)prevent media removal
		0	The medium-changer cannot lock the IEport
LOCK UNLOCK KEYPAD	LCK_KP	1	The medium-changer can lock / unlock the keypad
		0	The medium-changer cannot lock the keypad
CHANGER PREDISMOUNT ALIGN TO SLOT	PPOS_SL	1	The medium-changer requires a POSITION TO ELEMENT command to position the medium transport element to a slot before it can eject media from the slot
		0	The medium-changer does not require a POSITION TO ELEMENT command to position the medium transport element to a slot before it ejects media from the slot
CHANGER PREDISMOUNT ALIGN TO DRIVE	PPOS_DR	1	The medium-changer requires a POSITION TO ELEMENT command to position the medium transport element to a drive before it can eject media from the drive
		0	The medium-changer does not require a POSITION TO ELEMENT command to position the medium transport element to a drive before it can eject media from the drive
CHANGER PREMOUNT EJECT REQUIRED	MT_RQ	1	The medium-changer requires an explicit command issued to the drive to eject the drive mechanism before the changer can move media from a slot to the drive. (For example, a changer with CD-ROM drives might require the tray to be presented to the robotic transport so that a piece of media could be loaded onto the tray during a mount operation)
		0	The medium-changer requires no explicit command issued to the drive

			to eject the drive mechanism before the changer can move media from a slot to the drive.
CHANGER PREDISMOUNT EJECT REQUIRED	DIS_RQ	1	The medium-changer requires an explicit command issued to the drive to eject the media before the medium-changer can move the media from a drive to a slot
		0	The medium-changer requires no explicit command issued to the drive to eject the media before the medium-changer can move the media from a drive to a slot