T10/05-070r2 SMC-3 OPEN/CLOSE IMPORT/EXPORT ELEMENT command

To: T10 Technical Committee
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Subject: T10/05-070r0 SMC-3 OPEN/CLOSE IMPORT/EXPORT ELEMENT command

Revision History
Revision 0 (11 February 2005): initial revision
Revision 1 (8 March 2005): incorporated March SMC-3 WG comments
Revision 2 (29 June 2005): accepted changes made in revision 1 and incorporated comments from May
        SMC-3 WG and Ralph O. Weber

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

Overview
Many media changers with an import/export element implement a vendor specific command to open and
or close the import/export element (mail-slot) to facilitate the user with the import cartridge procedure.
This document proposes a SCSI command to standardize this functionality.

Suggested Changes to SMC-3

Table 3 – Commands for independent media changers
[Add a row for:]
OPEN/CLOSE IMPORT/EXPORT ELEMENT, 1Bh, O, 6.x

Table 5 – SMC commands allowed in the presence of various reservations
[Add a row for:]
OPEN/CLOSE IMPORT/EXPORT ELEMENT, Conflict, Conflict, Conflict, Allowed, Conflict, Conflict

[Add paragraph]
5.3.4 Import/export element
Import/export elements are locations of volumes that are being inserted into or withdrawn from the media
changer. A volume in one of these elements is accessible by at least one medium transport element in
the media changer, by the operator, or by another media changer device (i.e., interconnected media
changer devices). Support for an import/export element is optional.

Any import/export element may be capable of import actions only, export actions only, or both.

The OPEN/CLOSE IMPORT/EXPORT ELEMENT command (see 6.x) may be used to open or close the
import/export element. Whenever the OPEN/CLOSE IMPORT/EXPORT ELEMENT command causes a
state change of the import/export element the device server shall establish a unit attention condition with
the additional sense code set to IMPORT OR EXPORT ELEMENT ACCESSED for the initiator port
associated with all I_T nexuses other than the I_T nexus on which the OPEN/CLOSE IMPORT EXPORT
ELEMENT command was received.

An import/export element address may be a source or destination address in a MOVE MEDIUM
command or the optional EXCHANGE MEDIUM command. Import/export elements may or may not
provide independent storage of a volume.

[Add chapter]
6.x OPEN/CLOSE IMPORT/EXPORT ELEMENT command
The OPEN/CLOSE IMPORT/EXPORT ELEMENT command (see table X) provides a method for the
application client to change the open/closed state of the specified element address. The ELEMENT
ADDRESS field specifies the element address and the SERVICE ACTION CODE field specifies the requested
action to the device server.

Support for this command is optional for independent media changers. This command has no command parameter data. No command response data is returned.

Table X – OPEN/CLOSE IMPORT/EXPORT ELEMENT command

Bit Byte	7	6	5	4	3	2	1	0
0	OPERATION CODE 1Bh							
1	Reserved				SERVICE ACTION ~~CODE~~			
2	(MSB)			ELEMENT ADDRESS				
3								(LSB)
4	Reserved							
5	CONTROL							

The service actions defined for the OPEN/CLOSE IMPORT/EXPORT ELEMENT command are shown in table X+1. ~~The ACTION CODE field specifies the requested action for the specified element within the media changer~~. ~~If the device server supports the OPEN/CLOSE IMPORT/EXPORT ELEMENT command, it shall support one or more of the listed action codes.~~ If the value in~~of~~ the SERVICE ACTION~~action code~~ field is not supported, the device server shall return CHECK CONDITION status. The sense key shall be ILLEGAL REQUEST and the additional sense code INVALID FIELD IN CDB.

~~Table X+1. Supported Action Codes~~
Table X+1 – OPEN/CLOSE IMPORT/EXPORT ELEMENT service actions

~~ACTION CODE~~ Service Action	~~Description~~ Name
0h – 1h	Reserved
2~~1~~h	~~Open import/export element for operator access~~ OPEN IMPORT/EXPORT ELEMENT FOR OPERATOR ACCESS
3h	Reserved
4~~2~~h	~~Close import/export element~~ CLOSE IMPORT/EXPORT ELEMENT
5~~3~~h – 1F~~7~~h	Reserved

An OPEN/CLOSE IMPORT/EXPORT ELEMENT command with OPEN IMPORT/EXPORT ELEMENT FOR OPERATOR ACCESS service action shall cause the media changer to open the import/export element with the element address specified in the ELEMENT ADDRESS field.~~If ACTION CODE is set to 1h (Open import/export element for operator access) the media changer shall open the specified import/export element.~~ It is not considered an error when the import/export element was already open.

An OPEN/CLOSE IMPORT/EXPORT ELEMENT command with CLOSE IMPORT/EXPORT ELEMENT service action shall cause the media changer to close the import/export element with the element address specified in the ELEMENT ADDRESS field.~~If SERVICE ACTION CODE is set to 2h (Close import/export element) the media changer shall close the specified import/export element.~~ It is not considered an error when the import/export element was already closed.

If the logical unit has medium removal prevented the device server may return CHECK CONDITION status when service action~~the ACTION CODE~~ is set to OPEN IMPORT/EXPORT ELEMENT FOR OPERATOR ACCESS~~"Open import/export element for operator access"~~. The sense key shall be set to ILLEGAL REQUEST and the additional sense code to MEDIUM REMOVAL PREVENTED.

If the address specified in the ELEMENT ADDRESS field has not been assigned or has been assigned to an element type other than import/export element, the device server shall return CHECK CONDITION status. The sense key shall be set to ILLEGAL REQUEST and the additional sense code to INVALID ELEMENT ADDRESS.

After a state change of the import export element the device server ~~may~~ shall establish a unit attention condition with the additional sense code set to IMPORT OR EXPORT ELEMENT ACCESSED for the initiator port associated with all I_T nexuses other than the I_T nexus on which the OPEN/CLOSE IMPORT EXPORT ELEMENT command was received.

[Editor Note: The name OPEN/CLOSE IMPORT/EXPORT ELEMENT suggests this command only controls the Import/Export element. If we at a later state define service actions to release magazines, open doors, etc we should consider a more universal name. Therefore I propose to rename the OPEN/CLOSE IMPORT/EXPORT ELEMENT command. Some suggestions: OPEN/CLOSE ELEMENT, OPEN/CLOSE, or ACCESS ELEMENT.]