T10/08-424r0 SMC-3 Move volumes by bar code label

To: T10 Technical Committee
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Revision History
Revision 0 (27 Oktober 2008): initial revision

Related Documents
SMC-3 r12 - SCSI Media Changer Commands – 3, revision 12

Overview
One of the ISV questionnaires mentioned that the ability to move volumes in a media changer based
on bar code labels is desired. This proposal adds this feature as part of the SEND VOLUME TAG
command. This command is capable to support this feature because it already uses command
parameter data to transfer bar code labels, has enough unassigned action codes for this new feature,
and the CDB has a field to specify the destination element address.

Suggested changes to SMC-3

6.15 SEND VOLUME TAG command
6.15.1 SEND VOLUME TAG introduction

The SEND VOLUME TAG command (see table 40) is used to select volumes, to associate new
volume tag information with a volume, ~~or~~ to clear volume tag information for a volume, or to move a
volume by volume tag information. The function of the command is conveyed by the SEND ACTION CODE
field value. The REQUEST VOLUME ELEMENT ADDRESS command (see 6.14) may be used to
transfer the results of a select function. Device servers that implement the SEND VOLUME TAG
command shall also implement the REQUEST VOLUME ELEMENT ADDRESS command.

Table 40 — SEND VOLUME TAG command

Bit Byte	7	6	5	4	3	2	1	0
0	OPERATION CODE (B6h)							
1	Reserved				ELEMENT TYPE CODE			
2	(MSB)			ELEMENT ADDRESS				
3								(LSB)
4	Reserved							
5	Reserved			SEND ACTION CODE				
6	Reserved							
7	Reserved							
8	(MSB)			PARAMETER LIST LENGTH				
9								(LSB)
10	Reserved							
11	CONTROL							

The ELEMENT TYPE CODE field specifies the element type (see table 24) to be searched when the SEND
ACTION CODE field is set to a select function. If the ELEMENT TYPE CODE field is set to zero, then all
element types are candidates for a select function. If the SEND ACTION CODE field is not set to a select
function, then this field shall be treated as reserved.
The ELEMENT ADDRESS field specifies an element address whose interpretation depends on the SEND
ACTION CODE field. When the SEND ACTION CODE field is set to a select function, the ELEMENT ADDRESS

field specifies the starting element to be examined for satisfaction of the select criteria. When the SEND ACTION CODE field is set to an assert, replace, or undefine function, then the ELEMENT ADDRESS field specifies the specific element address where volume tag information for a volume is to be modified. When the SEND ACTION CODE field is set to a move volume function, then the ELEMENT ADDRESS field specifies the value of the destination element address.

See SPC-3 for a definition of the PARAMETER LIST LENTH field. See SAM-3 for a description of the CONTROL byte.

6.15.2 Send action codes

The SEND ACTION CODE field specifies the function to be performed by the SEND VOLUME TAG command. The supported send action codes are listed in table 41.

Table 41 — Send action codes

Code	Description
0h	Select - search all defined volume tags - including sequence numbers
1h	Select - search only primary volume tags - including sequence numbers
2h	Select - search only alternate volume tags - including sequence numbers
3h	Reserved
4h	Select - search all defined tags - ignore sequence numbers
5h	Select - search primary tags - ignore sequence numbers
6h	Select - search alternate tags - ignore sequence numbers
7h	Reserved
8h	Assert - as the primary volume tag - if tag now undefined
9h	Assert - as the alternate volume tag - if tag now undefined
Ah	Replace - the primary volume tag - current tag ignored
Bh	Replace - the alternate volume tag – current tag ignored
Ch	Undefine - the primary volume tag - current tag ignored
Dh	Undefine - the alternate volume tag - current tag ignored
0Eh – 0Fh	Reserved
10h	Move volume – by primary volume tag
11h	Move volume – by secondary volume tag
12h – 1Bh	Reserved
1Ch – 1Fh	Vendor-specific

Select functions requests the logical unit to search the volume tag information available for volumes at defined element addresses for volume tag information that matches the volume identifier template given by the command parameter data. Only volumes residing in elements with the same element type as defined by the ELEMENT TYPE CODE field and with element addresses starting from the element address as defined by the ELEMENT ADDRESS field are searched. When the select function requires checking sequence numbers, only volume tag information with sequence numbers in the range between the minimum and maximum volume sequence numbers given by the command parameter data (see table 41) are searched. The resulting information may be reported via the REQUEST VOLUME ELEMENT ADDRESS command.

Assert functions define volume tag information for a single volume at an element address that does not currently have defined volume tag information. If the volume at the selected element address already has defined volume tag information, then CHECK CONDITION status shall be returned. The sense key shall be set to ILLEGAL REQUEST, and the additional sense code set to INVALID FIELD IN CDB. In this case, the original volume tag information shall not be changed.

Replace functions define or overwrite volume tag information for a single volume at an element address. Any previously defined volume tag information is overwritten.

Undefine functions cause any previously defined volume tag information for the volume at the specified element address to be cleared. It shall not be considered an error to undefine volume tag

information that was not previously defined. For undefine functions the PARAMETER LIST LENGTH field shall be set to zero.

Move volume functions provide means to move a volume specified by volume tag information to a destination element address. The VOLUME IDENTIFIER TEMPLATE field in the command parameter data specifies the volume identifier and the MINIMUM VOLUME SEQUENCE NUMBER field specifies the volume sequence number. The MAXIMUM VOLUME SEQUENCE NUMBER field in the command parameter data shall be ignored. The ELEMENT ADDRESS field in the CDB specifies the destination element address.

If a logical unit implements volume tag information, then it may choose to not implement the functions that modify volume tag information. For such an implementation a request for any assert, replace or undefine function shall cause the SEND VOLUME TAG command to be terminated with CHECK CONDITION status. The sense key shall be set to ILLEGAL REQUEST, and the additional sense code set to INVALID FIELD IN CDB.

6.15.3 SEND VOLUME TAG parameter data

The volume identifier template and the minimum and maximum volume sequence numbers sent as command parameter data for the select, assert and replace functions are defined in table 42.

Table 42 — SEND VOLUME TAG parameter data format

Bit / Byte	7	6	5	4	3	2	1	0
0	(MSB)							
			VOLUME IDENTIFIER TEMPLATE					
31								(LSB)
32								
				Reserved				
33								
34	(MSB)							
			MINIMUM VOLUME SEQUENCE NUMBER					
35								(LSB)
36								
				Reserved				
37								
38	(MSB)							
			MAXIMUM VOLUME SEQUENCE NUMBER					
39								(LSB)

When the SEND ACTION CODE field is set to a select function the VOLUME IDENTIFIER TEMPLATE field specifies a search template.

As a search template, this field may contain the wildcard characters '?' and '*' (3Fh and 2Ah).

    a) '?' shall match any single character; and
    b) '*' shall match any string of characters. When it appears in a template the remainder of the template at higher offsets in the field is not used.

When the SEND ACTION CODE field is set to an assert or replace function the VOLUME IDENTIFIER TEMPLATE field specifies the value of the new volume identifier for the volume currently residing at the specified element address.

When the SEND ACTION CODE field is set to a move volume function, the VOLUME IDENTIFIER TEMPLATE field specifies the value of the volume identifier of the requested volume to be moved.

For an assert or replace, or move volume function, if the VOLUME IDENTIFIER TEMPLATE field contains the '?' or '*' wildcard characters, then the device server shall terminate the command with CHECK CONDITION status. The sense key shall be set to ILLEGAL REQUEST, and the additional sense code set to INVALID FIELD IN PARAMETER LIST.

The MINIMUM VOLUME SEQUENCE NUMBER field specifies the new sequence number for the assert and replace functions. For a select function, this field specifies the least value in the volume sequence number field of the volume tag information that meets the search specification. For a move volume

function, this field specifies the value of the volume sequence number of the requested volume to be moved.

The MAXIMUM VOLUME SEQUENCE NUMBER field specifies the maximum value in a volume sequence number field of the volume tag information that meets the search specification. This field is ignored for assert, and replace, and move volume functions.