T10/05-414r0 SMC-3 Clarification SEND VOLUME TAG command

To: T10 Technical Committee
From: Noud Snelder, BDT (noud.snelder@bdt.de)
Date: 03 November 2005
Subject: T10/05-414r0 SMC-3 Clarification of SEND VOLUME TAG command

Revision History
Revision 0 (03 November 2005): initial revision

Related Documents
SMC3r01 - SCSI Media Changer Commands - 3 revision 1

Overview
In smc3r01, section 6.13 defines the SEND VOLUME TAG command. The documentation however is not always clear. This proposal tries to clarify the command description.

Suggested Changes to SMC-3

6.13 SEND VOLUME TAG command

6.13.1 SEND VOLUME TAG introduction

The SEND VOLUME TAG command (see table 26) transfers a volume tag template to be used for a search of existing volume tag information or to associate new volume tag information with a volume or to clear volume tag information for a volume~~one media changer element address~~. The function of the command is conveyed by the SEND ACTION CODE field value. The REQUEST VOLUME ELEMENT ADDRESS command may be used to transfer the results of a ~~translate~~ search operation.

Support for this command is optional for independent media changers.

Table 26 — 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 an element type specification as defined in the READ ELEMENT STATUS command (see table 15). If the SEND ACTION CODE field indicates a translate ~~operation~~function, this field indicates the element type~~s~~ to be searched. If the value is zero, all

element types are candidates for a translate operationfunction. If the SEND ACTION CODE field does not indicate a translate function, this field shall be treated as reserved.

The ELEMENT ADDRESS field gives a media changer element address whose interpretation depends on the SEND ACTION CODE field. When the SEND ACTION CODE field is a translate function, the element address field gives the starting element to be examined for satisfaction of the search criteria. When the SEND ACTION CODE field is an assert, replace, or undefine function, the ELEMENT ADDRESS field gives the specific element address where volume tag information for a volume is to be modified.

6.12.2 Send action codes

The SEND ACTION CODE field gives specifies the function to be performed by theis SEND VOLUME TAG command. The supported send action codes are as listed in table 27.

Table 27 — Send action codes

Code	Description
0h	Translate - search all defined volume tags - check sequence numbers
1h	Translate - search only primary volume tags - check sequence numbers
2h	Translate - search only alternate volume tags - check sequence numbers
3h	Reserved
4h	Translate - search all defined volume tags - ignore sequence numbers
5h	Translate - search primary volume tags - ignore sequence numbers
6h	Translate - search alternate volume 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
Eh – 1Bh	Reserved
1Ch – 1Fh	Vendor-specific

Translate operations functions request that the logical unit 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 volume tag information with the same element type as defined by the ELEMENT TYPE CODE field and element addresses starting from the element address as defined by the ELEMENT ADDRESS field are searched. When the translate function requires checking sequence numbers, only volume tag information with sequence numbers in the range between the minumum and maximum sequence number are searched. The resulting information may be reported via the REQUEST VOLUME ELEMENT ADDRESS command.

Assert operations 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, 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. Support for this the send action code field set to an assert function value is optional.

Replace ~~operations~~ functions define or overwrite volume tag information for a single volume at one element address. Any previously defined volume tag information is overwritten. Support for ~~this~~ the send action code field set to a replace function value is optional.

Undefine ~~operations~~ 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 must be set to zero. Support for ~~this~~ the send action code field set to an undefine function value is optional.

If a logical unit implements volume tag information, 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.

6.12.3 SEND VOLUME TAG parameter data

~~The PARAMETER LIST LENGTH field shall be zero for undefine functions.~~ The volume tag information sent as command parameter data for translate, assert and replace functions is defined in table 28. No command parameter data is send for undefine functions.

Table 28 — Send volume tag parameters format

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

When the send action code field is set to an translate function t~~T~~he VOLUME IDENTIFIER TEMPLATE field specifies a search template.

When the send action code field is set to an assert or replace function the VOLUME IDENTIFIER TEMPLATE field specifies ~~or~~ the ~~exact~~ value of the new volume identifier for ~~other SEND VOLUME TAG command functions~~ the volume currently residing at the specified element address.

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

    a)   '?' shall match any single character;

    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.

For an assert~~,~~ or replace~~, or undefine~~ function, if the VOLUME IDENTIFIER TEMPLATE field contains the '?' or '*' wildcard characters, the device server shall return CHECK CONDITION status. The sense key shall be ILLEGAL REQUEST and the additional sense code INVALID FIELD IN PARAMETER LIST.

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

[Editors note: Is the VOLUME SEQUENCE NUMBER field in the volume tag changeable? I suppose volume sequence numbers are defined by the physical position of the element. And therefore cannot be changed by an assert or replace function.]

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, replace and undefine functions.

[Editors note: It is undocumented what happens with assigned volume tag information (by means of the assert or replace functions) after an INITIALIZE ELEMENT STATUS command or INITIALIZE ELEMENT STATUS WITH RANGE command. Need to specify when assigned volume tag information is lost/overwritten by bar code information.]