memorandum

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T10/06-046r5

To	From	Subject	Date
INCITS T10 Committee	Curtis Ballard, HP Michael Banther, HP	Report Supported Volume Types	30 June, 2006

Revision History

Revision 0 – Initial document.

Revision 1 – Changes from Jan 06 T10
Changed to identifier form for return data

Revision 2 – Changed return data form to more generic descriptor
Removed "ELEM" bit option since "Report Element Information" command will be used to report individual elements
Removed support for data transfer device inquiry in favor of "Report DTD Inquiry" proposal 05-243r3
Added model clause section
Reduced detail level of returned information to only static details about the medium type

Revision 3 – Incorporated changes from March 27, 06 conference call
Changed primary medium type to volume type in command name and all other references
Changed secondary medium type to volume qualifier
Split defined media types table into two for volume type and qualifier then moved from model clause to command
Added a definition for "form factor"
Removed the "SUPPORTED" bit from the CDB and the corresponding UPG bit from the descriptor
Corrected byte numbering on tape y+1
Removed "MEDIUM TYPE" and "MAM" from the descriptor.
Changed ASCII text in descriptor to text based on a "CODE SET"
Reserved 80h-FFh in Volume Type and Volume Qualifier tables
Reserved 00h in Volume Type table

Revision 4 – Incorported changes discussed at May 06 T10
Changed "providing storage" to "accepting" in overview
Added reference to section 3.1.13 in overview
Added paragraph to overview for how to query device server for supported volume types and qualifiers
Removed extra reserved bits from bytes 4/5 of Volume Type Descriptor
Corrected byte numbering of Volume Type Descriptor
Added "field" to label for tables y+3 and y+4
Added "code" to first row heading for tables y+3 and y+4
Moved requirement for support of all qualifiers if reporting universal to normative text
Cleaned up table y+5 and added note referencing table same as similar in SPC-3
Added definitions for type and qualifier description length fields in table y+2
Revised definitions for content of volume type/qualifier description fields.
Moved assignement for types/qualifiers recommendation to normative text
Revised description of VOLUME TYPE and VOLUME QUALIFIER in 3.5.2
Revised statement regarding use of command to report supported types in 3.5.2
Moved tables defining valid values of the type and qualifier into 3.5.2
Changed to an 8 byte header for the descriptor
Merged separate descriptions for type and qualifier into a single description for that combination
Added requirement of universal descriptor for the generic family name.
Added requirement of null-terminated, null-padded 4 byte multiple for description

Revision 5 – Editorial changes
Clarified requirement for universal volume qualifier for all supported volume types
Added should clause for returning all supported qualifiers
Descriptor name changed back to name used in version 3, Volume Type Descriptor
Moved length field in table y+4 and corrected byte numbering in same table

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Related Documents

smc3r01 – SCSI Media Changer Commands - 3 revision 01

spc3r23 – SCSI Primary Commands -3 revision 23

Background

The Read Element Status command is used by applications to describe the contents of all elements within a media changer device. Information about the element compatibility and type of medium in the elements is not currently captured and media changer vendors have implemented several vendor unique methods for reporting those attributes. Most media changer vendors report media type information using two vendor unique values for medium domain which is the physical shape and medium type which is the particular media generation or variant within that domain.

A new command is proposed that provides a way for media changers to report what values will be used to describe the medium supported by the media changer and report which data transfer devices support that medium type.

In the proposed changes that follow, new text appears in blue or purple, deleted text appears in ~~red strikeout~~, and editorial comments appear in green.

Proposed Changes to SMC-3

New sub-clause 3.1.13 (others shift down)

3.1.13 form factor: The external physical characteristics of a volume that affect the fit of the volume in any element.

New sub-clause 5.3.2 (others shift down)

5.3.2 Volume types overview

Each element in a media changer is capable of accepting one or more types of volumes. The VOLUME TYPE field and the VOLUME QUALIFIER field describe a volume type supported by an element.

The VOLUME TYPE shall be the same for all media with the same form factor (see 3.1.13). The VOLUME TYPE codes are defined in table y.

Table y – VOLUME TYPE field values

Code	Description
00h	Reserved
01h – 7Fh	Vendor-specific
80h – FFh	Reserved

Comment: Some special volume type values such as universal or unknown may be defined in the future and cause the volume qualifier to be ignored.

The VOLUME QUALIFIER describes additional characteristics of the volume. The VOLUME QUALIFIER codes are defined in table y+1.

Table y+1 – VOLUME QUALIFIER field values

VOLUME TYPE code	Description
00h	Universal
01h – 7Fh	Vendor-specific
80h – FFh	Reserved

The REPORT VOLUME TYPES SUPPORTED command (see 6.X) allows the application client to retrieve the set of valid VOLUME TYPE field and VOLUME QUALIFIER field combinations.

Changes to 6.1

Table 3, summary of commands for independent media changers, has the following addition (the entire table is not reproduced here).

Comment: Pending proposals may renumber the command sections so no section number is assumed.

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Command	Operation Code	Type	Reference
REPORT VOLUME TYPES SUPPORTED	44h	O	6.x

Changes to 6.3:

Table 5 has the following addition (the entire table is not reproduced here):

REPORT VOLUME TYPES SUPPORTED	Allowed	Allowed	Allowed	Allowed	Allowed	Allowed

New sub-clause 6.x:

6.x REPORT VOLUME TYPES SUPPORTED command

The REPORT VOLUME TYPES SUPPORTED command (see table y+2) requests that information regarding the supported volume types for the device be sent to the application client.

Table y+2 – REPORT VOLUME TYPES SUPPORTED command

Byte \ Bit	7	6	5	4	3	2	1	0
0	OPERATION CODE (44h)							
1	Reserved							
2	Reserved							
3	Reserved							
4	Reserved							
5	Reserved							
6	Reserved							
7	(MSB)			ALLOCATION LENGTH				
8								(LSB)
9	CONTROL							

See SPC-3 for the definition of the OPERATION CODE, ALLOCATION LENGTH, and CONTROL fields.

The REPORT VOLUME TYPES SUPPORTED command returns a volume types supported header (see table y+3) followed by one of more volume type descriptors (see table y+4).

Table y+3: Volume types supported header

Byte \ Bit	7	6	5	4	3	2	1	0
0	Reserved							
1	DESCRIPTORS COUNT							
2	(MSB)			DESCRIPTORS LENGTH (x-3)				
3								(LSB)
4	Volume type descriptors							
x								

The DESCRIPTORS COUNT field contains a count of the total number of descriptors to follow. If the descriptors field is truncated because of the allocation length, the DESCRIPTORS COUNT field shall not be affected.

The DESCRIPTORS LENGTH field contains the total length in bytes of the descriptors to follow. If the descriptors are truncated because of the allocation length, the DESCRIPTORS LENGTH field shall not be affected.

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6.x.1 Volume Type Descriptor

Table y+4 defines the Volume Type descriptor.

Table y+4: Volume Type Descriptor

Bit / Byte	7	6	5	4	3	2	1	0
0	VOLUME TYPE							
1	VOLUME QUALIFIER							
2	Reserved							
3	Reserved				CODE SET			
4	Reserved							
5								
6								
7	DESCRIPTION LENGTH (y-8)							
8	VOLUME DESCRIPTION							
y								

Volume Type descriptors shall be returned by ascending VOLUME TYPE field values. Multiple entries may exist for a given VOLUME TYPE field value. For all entries with equal VOLUME TYPE field values the volume type descriptors shall be returned by ascending VOLUME QUALIFIER field values.

The VOLUME TYPE field contains a vendor specified value for a volume type that may be used in the device (see 5.3.2).

The VOLUME QUALIFIER field contains a vendor specified qualifier for a volume type that may be used in the device (see 5.3.2). The device server should return all supported VOLUME QUALIFIER field values. For each supported VOLUME TYPE field value, the device server shall return a descriptor for the universal VOLUME QUALIFIER (see table y+1) with the description set to the common name for that media type.

The CODE SET field (see table y+5) specifies the format of the data in the VOLUME DESCRIPTION field.

Table y+5 – Description formats

Format	Description
0-1	Reserved
2	The VOLUME DESCRIPTION field contains left-aligned ASCII data (see SPC-3 4.4.1)
3	The VOLUME DESCRIPTION field contains ISO/IEC 10646-1 (UTF-8) codes
4-F	Reserved

COMMENT: The definition of the CODE SET field follows that of the CODE SET field in SPC-3 (see SPC-3 7.6.3.1).

The DESCRIPTION LENGTH field contains the total length in bytes of the VOLUME DESCRIPTION field. The DESCRIPTION LENGTH shall be a multiple of four.

The VOLUME DESCRIPTION field shall contain a null-terminated, null-padded vendor specific description in the format specified by the CODE SET field.