

# memorandum



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T10/06-046r3

**To** INCITS T10 Committee  
**From** Curtis Ballard, HP  
Michael Banther, HP  
**Subject** Report Supported Volume Types

**Date**  
24 April 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

## 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.



T110/06-046r3

New sub-clause 5.3.2 (others shift down)

5.3.2 Volume types overview

Each element in a media changer is capable of providing storage for one or more types of volumes. The volume types supported by an element can be described using a two byte code containing a VOLUME TYPE field and a VOLUME QUALIFIER field.

The VOLUME TYPE shall be the same for all media with the same form factor.

The VOLUME QUALIFIER describes additional characteristics of the volume.

Changes to 6.1

Table 3, summary of commands for independent media changes, 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.

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
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New sub-clause 6.x:

**6.x REPORT VOLUME TYPES SUPPORTED command**

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

**Table y – REPORT VOLUME TYPES SUPPORTED command**

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						(LSB)
8								
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+1) followed by one of more volume type descriptors (see table y+2).



**Table y+1: Volume types supported header**

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

**6.x.1 Volume Type Descriptor**

Table y+2 defines the volume type descriptor.

**Table y+2: Volume Type Descriptor**

Bit	7	6	5	4	3	2	1	0
Byte								
0	VOLUME TYPE							
1	VOLUME QUALIFIER							
2	Reserved							
3	Reserved				CODE SET			
4	Reserved		TYPE DESCRIPTION LENGTH (x)					
5	Reserved		QUALIFIER DESCRIPTION LENGTH (w)					
x bytes	Volume Type Description							
w bytes	Volume Qualifier Description							

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 TYPE codes are defined in table y+4.

**Table y+3 – VOLUME TYPE values**

VOLUME TYPE	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 field contains a vendor specified qualifier for a volume type that may be used in the device (see 5.3.2). The device server may return a universal volume qualifier if at least one data transfer device can accept any volume with the specified volume type. The VOLUME QUALIFIER codes are defined in table y+4.

Note XX – When reporting a universal volume qualifier consideration should be made for the possibility of new qualifiers being defined in the future which must also be accepted by at least one data transfer device.

**Table y+4 – VOLUME QUALIFIER values**

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

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T10/06-046r3

The CODE SET field (see table y+5) specified the format of the data in the volume type and volume qualifier description fields.

**Table y+5 - Description formats**

<b>Format</b>	<b>Name</b>	<b>Description</b>
00b	BINARY	The Description fields contain binary data
01b	ASCII	The Description fields contain left-aligned ASCII data (see SPC-3 4.4.1)
10b	TEXT	The Description fields contain ISO/IEC 10646-1 (UTF-8) codes
11b		Reserved

The Volume Type Description field shall contain a left aligned vendor specific description. The volume type description shall be the same for all volumes with the same volume type.

The Volume Qualifier Description field shall contain a left aligned vendor specific description.

Note XX – A recommended method of assigning volume type and volume qualifier descriptions is for the body responsible for the media specifications to assign a value for all media changer vendors to use.