To: INCITS T10 Committee

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Subject: SSC-3 add report to REPORT DENSITY SUPPORT command

1 Revision History

Revision 0:
Posted to the T10 web site 23 March 2004.

Revision 1:
Updated per discussion at SSC working group meeting on 4 May 2004.

Revision 2:
Removed the phrase "the application client should assume" from the description of the DLV bit as
agreed to by the SSC-3 WG at the July 2004 T10 meeting.

2 General

SSC added a command to the Stream Device command set to allow a device to describe codes
used in the density field of MODE SENSE and MODE SELECT Block Descriptor that were
defined by various standards bodies or by individual vendors. This allowed the tables defining
density codes to be removed from the T10 standards and allowed new density codes to be
defined as new tape formats were invented or standardized without impacting SSC.

During the development of SSC, the Medium Type field in the MODE header was changed from
Reserved to Vendor Specific to allow a device to identify a medium type to the application client
to aid it in selecting a density code. This proposal provides a method for the SSC-3 device server
to report the Medium Type codes it supports, and to provide descriptions for them. This
information can be passed on to a user to aid in selection of medium, or used by an automation
device to manage mixed medium environments.

This proposal modifies the current REPORT DENSITY SUPPORT command to add a new report
type to it. Currently, this command returns a header and set of descriptors that describe density
code values. A bit in the CDB controls if all densities supported by the device are reported, or
only those supported for the current medium. This proposal adds another bit to byte 1 of the CDB
to indicate that Medium Type descriptors should be returned instead of Density Descriptors.

3 Proposal

Modify the REPORT DENSITY SUPPORT command section as follows:

Add a section header for the command description:
7.7.1 REPORT DENSITY SUPPORT command description

Modify the first paragraph in this section as follows:
The REPORT DENSITY SUPPORT command (see table 41) requests that information regarding
the supported densities or medium type for the logical unit be sent to the application client.

Add a bit field in byte 1, bit 1, named Medium Type.

Modify the paragraph that describes the MEDIA bits as follows:

A MEDIA bit of zero specifies the device server shall return ~~density support data block~~ descriptors for densities or medium types supported by the logical unit for any supported media. A MEDIA bit of one specifies the device server shall return ~~density support data block~~ descriptors for densities or the medium type supported by the mounted medium. If the MEDIA bit is one and the logical unit either contains no medium or contains a medium but cannot determine the medium's density or type, CHECK CONDITION status shall be returned. The sense key shall be set to NOT READY and the additional sense code shall specify the reason for NOT READY.

In the paragraph that describes the AVAILABLE DENSITY SUPPORT LENGTH field, remove the following sentence: "This field shall be equal to 2 more than an integer multiple of 52 (the length in bytes of a density support data block descriptor)."

Add the following paragraph to describe the MEDIUM TYPE bit:

If the MEDIUM TYPE bit is set to zero, the device server shall return data as described in 7.7.2. If the MEDIUM TYPE bit is set to one, the device server shall return data as described in 7.7.3.

Add a section header 7.7.2 before the paragraph that follows the description of the ALLOCATION LENGTH field. Modify the first paragraph in this section as follows:

7.7.2 Density support report

The REPORT DENSITY SUPPORT command with a MEDIUM TYPE field bit set to zero returns the REPORT DENSITY SUPPORT header (see table 42) followed by one or more density support data block descriptors (see table 43). The density support data block descriptors shall follow the density support header. The density support data block descriptors shall be in numerical ascending order of the PRIMARY DENSITY CODE value.

In table 43, add a bit field to byte 2, bit 0, named "DLV". Change bytes 3 and 4 from Reserved to DESCRIPTOR LENGTH. Add the following paragraphs following the table to describe these fields.

If the Descriptor Length Valid (DLV) bit is set to one, the DESCRIPTOR LENGTH field shall contain the length of the descriptor minus 5. If the DLV bit is set to zero, the DESCRIPTOR LENGTH field shall be set to zero and the descriptor is 52 bytes in length.

Add a new section:

7.7.3 Medium Type support report

The REPORT DENSITY SUPPORT command with a MEDIUM TYPE field bit set to one returns the density support header (see table XX) followed by one or more medium type descriptors (see table XX). The medium type descriptors shall follow the density support header. The medium type descriptors shall be in numerical ascending order of the medium type value.

Table XX – Medium type descriptor

Bit Byte	7	6	5	4	3	2	1	0
0	MEDIUM TYPE							
1	Reserved							
2 - 3	Descriptor Length (52)							
4	NUMBER OF DENSITY CODES							
5 - 13	PRIMARY DENSITY CODES							
14 – 15	MEDIUM WIDTH							
16 - 17	MEDIUM LENGTH							
18 - 19	Reserved							
20 - 27	ASSIGNING ORGANIZATION							
28 – 35	MEDIUM TYPE NAME							
36 – 55	DESCRIPTION							

The MEDIUM TYPE field contains the value returned by a MODE SENSE command for the medium type described in the remainder of the medium type descriptor. The device server shall accept a MODE SELECT command containing this value, for appropriate media.

The DESCRIPTOR LENGTH field contains the length of the descriptor minus 4.

The NUMBER OF DENSITY CODES field contains the number of valid density codes present in the PRIMARY DENSITY CODES value field.

The PRIMARY DENSITY CODES field contains a list of primary density code values supported by the drive for the medium type. The primary density code values shall be listed in ascending order. Any unused bytes in this field shall contain zero.

The MEDIA WIDTH field specifies the width of the medium. This field has units of tenths of millimeters. The value in this field shall be rounded up if the fractional portion of the actual value is greater than or equal to 0,5.

The MEDIUM LENGTH field specifies the nominal length of the medium. This field has units of meters. The value in this field shall be rounded up if the fractional portion of the actual value is greater than or equal to 0,5.

The ASSIGNING ORGANIZATION field contains eight bytes of ASCII data identifying the organization responsible for the specifications defining the values in this medium type descriptor. The data shall be left aligned within this field. The ASCII value for a space (20h) shall be used if padding is required. The ASSIGNING ORGANIZATION field should contain a value listed in the vendor identification list (see SPC-3). The use of a vendor identification other than the one associated with the device is allowed.

NOTE 31 It is intended that the ASSIGNING ORGANIZATION field contain a unique identification of the organization responsible for the information in a medium type descriptor. In the absence of any formal registration procedure, T10 maintains a list of vendor and assigning organization identification codes in use. Vendors are requested to voluntarily submit their identification codes to prevent duplication of codes.

The MEDIUM TYPE NAME field contains eight bytes of ASCII data identifying the document (or other identifying name) that is associated with this medium type descriptor. The data shall be left aligned within this field. The ASCII value for a space (20h) shall be used if padding is required. Two different medium types shall not have identical ASSIGNING ORGANIZATION and MEDIUM TYPE NAME fields. Assigning organizations are responsible for preventing duplicate usage of one medium type name for multiple different medium types.

NOTE 32 It is suggested that any document that specifies a characteristics for the media contain the values to be used by a logical unit when reporting the density support. The values for the MEDIUM WIDTH and MEDIUM LENGTH should also be included in such a document to help maintain consistency.

The DESCRIPTION field contains twenty bytes of ASCII data describing the medium type. The data shall be left aligned within this field. The ASCII value for a space (20h) shall be used if padding is required.