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TO: X3T9.2 Committee   Document No: 88-
FROM: Kurt Chan, Hewlett-Packard
SUBJECT: Tape Read Density Reporting

Problem Description

Some applications and sequential-access device drivers need to know the
recorded density of the currently loaded medium (read density) for error
checking and proper identification of the tape. The SCSI-2 specification
for the MODE SENSE/SELECT block descriptor only reports the write density,
which for some sequential-access devices may be different than the read
density. The specification does not really give a detailed description of
the usage of the density code field, but implementations seem to
exclusively use this field to report and set the density at which the
medium will be recorded for write operations (write density). A method is
needed so that read density may be obtained from the device.

Proposed Solution Summary

The proposal is to have the Mode Sense block descriptor report both the
write and read densities for sequential-access devices. Byte 0 of the
block descriptor is for reporting and setting the write density. Byte 4 of
the block descriptor which currently is reserved would become device type
dependent and for the sequential-access would be used for reporting the
read density. Support for the reporting of a read density will require
some additional density codes to cover the possible exception conditions
where:

    o no medium is loaded,
    o the medium is blank,
    o the recorded density cannot be identified or is unsupported

Proposed Changes to Rev 6:

7.2.12 Generic Mode Parameter List

    In table 7-33 (Mode Parameter Block Descriptor) change
    byte 4 from reserved to being device type dependent.

9.3 Mode Parameters for Sequential-Access Devices

    Add a table similar to 7-33 showing the sequential-access
    usage of the block descriptor:

```
=====================================================================
   Bit|   7   |   6   |   5   |   4   |   3   |   2   |   1   |   0   |
   Byte|       |       |       |       |       |       |       |       |
=====================================================================
   0  |                    Write Density Code                        |
------|-------------------------------------------------------------|
   1  | (MSB)                                                        |
------|---                                                       ---|
   2  |                    Number of Blocks                          |
------|---                                                       ---|
   3  |                                                       (LSB) |
------|-------------------------------------------------------------|
   4  |                    Read Density Code                         |
------|-------------------------------------------------------------|
   5  | (MSB)                                                        |
------|---                                                       ---|
   6  |                    Block Length                              |
------|---                                                       ---|
   7  |                                                       (LSB) |
=====================================================================
```

Add the following definition for the write density code field:

The write density code field specifies the medium recording
density for write operations. Most sequential-access devices
will only allow the recorded density to change when writing the
first block on the medium.

Add the following definition for the read density code field:

The read density code field specifies the recorded density of the
currently loaded medium. The read density may not be changed by
the MODE SELECT command. If the device does not report the read
density this field shall be set to zero. (Note: This allows for
backwards compatibility.)

Change last sentence of last paragraph on page 9-41 from:

Table 9-21 lists the sequential-access device specific density
codes defined for byte zero of the block descriptor.

to

Table 9-21 lists the sequential-access device specific density
codes defined for bytes zero and four of the block descriptor.

Add to table 9-21 (Sequential-Access Density Codes):

7C   Unrecorded/Blank medium (read density code only)
7D   Unrecognizable/Unsupported density (read density code only)
7E   No medium loaded (read density code only)