To: Membership of X3T10

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Subject: Attached Medium Changer Operation Codes

As has been noted for sometime now, there is a conflict between operation code usages for CD-ROM devices and attached medium changers. This proposal, if approved, will resolve that conflict.

I believe that approved document X3T9.2/92-006r1 (Enhancement of Command Sets for Removable Media Devices with Medium Changers) intended that CD-ROM device be capable of having attached medium changers. My belief was confirmed (by lack of any opposing comment) at the January 1995 X3T10 Working Group meeting.

However, even in SCSI-2 R10C the MOVE MEDIUM command shared operation code A5h with the PLAY AUDIO(12) command. During preparation of the SCSI-3 Multi-Media Commands, the problem was compounded by making the READ ELEMENT STATUS command share operation code B8h with the SET CD-ROM SPEED command.

As a result, CD-ROM devices cannot have attached medium changers. In particular, the MOVE MEDIUM and READ ELEMENT STATUS read element status commands cannot be directed to a LUN with peripheral device type code 05h. The setting of the MChngr bit in the INQUIRY data is irrelevant. The LUN will not be able to distinguish MOVE MEDIUM from PLAY AUDIO(12) or READ ELEMENT STATUS from SET CD-ROM SPEED.

N.B. CD-ROM devices may still implement a medium changer as a separate LUN. However, the requirement to do this is absolutely counter to the intent of approved document X3T9.2/92-006r1 and, apparently, counter to the current wishes of the X3T10 Working Group. Furthermore, the X3T10 Working Group has shown no interest whatsoever in reversing its prior approval of 92-006r1.

I propose that the conflict be fixed by assigning different operation codes to the MOVE MEDIUM and READ ELEMENT STATUS commands for their attached medium changer usage. This proposal was generally endorsed at the January 1995 X3T10 Working Group meeting. However, a couple of conditions were attached to that endorsement. First, the usage of operation code A5h for the MOVE MEDIUM command and B8h for the READ ELEMENT STATUS command must continue to be sanctioned for medium changers attached to tape devices. Second, the new attached changer operation codes for the MOVE MEDIUM and READ ELEMENT STATUS commands must be completely unique (not shared with any device type).

With these requirements in mind, I propose that Table B.2 of the SCSI-3 Primary Commands be updated as follows:

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    OP  DTLPWRSOMCA  Description
    A5h O        M      MOVE MEDIUM
    A7h OO   OO OO      MOVE MEDIUM (attached)
    B4h OO   OO OO      READ ELEMENT STATUS (attached)
    B8h O        M      READ ELEMENT STATUS
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If approved, this proposal also requires equivalent changes in
the Table 5 of the SCSI-3 Primary Commands, changes in all the
SCSI-3 command documents that list the attached medium changer
commands, and changes in the SCSI-3 Medium Changer Commands
document.

In all cases (particularly the SPC and SMC), the A7h and B4h
operation codes must be described as the preferred usage for the
MOVE MEDIUM and READ ELEMENT STATUS commands, respectively, for
attached medium changer implementations. However, usage of the
A5h and B8h operation codes must be described as permissible for
older tape device implementations.