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December 5, 1987

Document: X3T9.2/87- 217

To the X3T9.2 Committee,

Subject: Scatter/Gather Media Access Commands

This proposal is prompted by document X3T9.2/87-203, subject: LOAD SKIP MASK COMMAND from Greg Floryance of IBM. That document defines a possible non-sequential media access scheme for inclusion in SCSI-2. My proposal assumes that the reader has read and understands 87-203. I agree that the ability to perform non-sequential logical block media access is desirable but I have two definite concerns about the current proposal.

The first reason is that of timing. I am concerned about any addition of this magnitude at this late date before the committee's desired forwarding schedule. Secondly, I believe that a more general "extent list" method, described below, is more appropriate. I suggest that the committee first consider that both proposals (both skip mask and extent list) be tabled until SCSI-3, and barring that favorable decision, that an extent list method be considered as an alternative to the skip mask.

LOAD EXTENT LIST Command

The extent list method leverages heavily upon the current definition of media accesses in SCSI. All transfers start at a designated logical block and continue sequentially for the number of blocks found in the transfer length. This start and length is termed an extent, as defined in Extent Reservation. The extent list method defines a new command, LOAD EXTENT LIST, that sends a list of extents for subsequent media access from the initiator to the target. This list of extents then is highly analogous to the current address-length passed in "normal" media access commands. The data phase out for this command is composed of a four byte header in which the first two bytes are reserved and the next two bytes describe the transfer length in bytes (allowing lengths of up to 64K bytes). Lengths sent in a LOAD EXTENT LIST command greater than the target's capacity shall result in Illegal Request. The remainder of the data phase is simply multiples of six-byte extents. These extents are NOT necessarily in sequential order. The target shall verify that all extents are valid before signaling Good status to the initiator. Any partial extents would therefore be detected by the target during this test. The target shall store the extent list until the next hard reset condition although the initiator may send a new LOAD EXTENT LIST at any time.

Extent List Media Access Commands

An extent list media access command is an extended Read or extended Write (extent list media access command) with bit 1, byte 1 set (this bit is now reserved). If the extent list bit is set, the initiator shall set the logical block address and the transfer length to zero. Please note that any subsequent extended media access command using the extent list need NOT be linked to the LOAD EXTENT LIST and that multiple extent list media access commands may utilize the same extent list. If an extent list has not been loaded and an extent list media access command is sent by the initiator, the target returns Illegal Request with a properly defined sense code.

Mode Sense Impact

Mode Sense would require a new field to be defined that would return the number of bytes available for the extent list. A reasonable place for this field would be in the Queue Control Parameters page (0A Hex).

Summary

I wish to repeat that I do not wish that any gather/scatter media access commands be included in SCSI-2 unless that standard is further delayed by other considerations. However, if and when such a capability is added, I believe that the extent list method is a more generally useful method than the skip mask. It would appear the extent list method applies to conventional file access methods, while the skip mask is applicable to special purpose media updates such as tree structures or batch data base updates. If considerable enthusiasm is generated for the skip mask, then perhaps we can combine the two proposals and place a page code in the data phase header for the new LOAD SKIP MASK/ EXTENT LIST command.

I hope that this proposal meets with your favor. Thank you for your attention.

Sincerely,



Dave McIntyre