X3T9.2/87-155

August 25, 1987

To: X3T9.2 Committee

From: Randy Weber, Emulex Corporation

Subject: Ending Extended Contingent Allegiance

Ref: 87-108, by Gary Stephens

There was some discussion of Gary's document at the last working group meeting; in particular, this memo proposes a solution to the question of how the target realizes the initiator has abandoned recovery and desires to continue operation (Item #4 in 87-108). This memo does not address the other issues raised by Gary (Items #1, #2. & #3).

The occurrence of Extended Contingent Allegiance, outside of Asynchronous event notification, is limited to either fatal write errors or a Volume Overflow occurring on previously buffered initiator data (or filemarks), or to a MISCOMPARE, FILEMARK, EOM or fatal read error occurring on previously buffered initiator data on a VERIFY command; in either case recovery first means giving the initiator the chance to extract that data back, to purge it out of the buffer, or to do nothing because some other initiator will. I think that this last option should not be ignored— one initiator may clean-up the mess that other initiators leave behind, since they may have dropped off-line after dumping their data to the target (which might have lots of buffer).

There may be additional initiator actions performed once the buffered data is dealt-with, some may involve medium motion such as SPACE or ERASE. What happens if another WRITE or VERIFY command follows? In the case of VERIFY, it is certainly possible another VERIFY command will follow, with new data.

I've noticed that the LOAD/UNLOAD and REWIND commands in SCSI-2 Version 2 have a new ending paragraph which attempts to handle the condition. I believe the paragraph is incomplete because it is too broad. For example, the command sequence:

WRITE 100 BLOCKS, FIXED+IMMEDIATE
Good Status

WRITE 10 BLOCKS, FIXED+IMMEDIATE
Check Condition

REQUEST SENSE
Recoverable Error, Residue=0
Where the Recoverable error was encountered on the 100 block WRITE command; and, the 10 block WRITE command is below the buffer threshold to start writing, so it's still in the buffer.

REWIND
Good Status

will cause the 10 blocks waiting in the buffer to be written to be discarded, because the REWIND command followed a command with a CHECK CONDITION. What is expected is that the REWIND command would flush the buffer to the tape before performing the rewind operation.

There are reasons a CHECK CONDITION could occur on the WRITE command which are not fatal and do not leave stranded data in the buffer, like RECOVERABLE ERROR, LOG OVERFLOW, or VENDOR UNIQUE. If the new paragraph is to remain, and there was some debate earlier if it should, it must be rewritten.

Proposal

#1 Omit the new paragraph, and add a paragraph outside the commands which basically says: Extended Contingent Allegiance is broken (terminated) if the initiator performs either a medium access command (READ REVERSE, ERASE), or a command which performs logical or physical medium motion (SPACE, REWIND, UNLOAD/LOAD, Change of Partition). All buffered data will be purged before the new command is executed, which will conclude the Extended Contingent Allegiance condition.

The Recover Buffered Data command and all information-type commands (INQUIRY, MODE SENSE, REQUEST SENSE, READ LOG, etc..) will not cause the Extended Contingent Allegiance to be broken. Of course, the concept of Extended Contingent Allegiance must be defined too.

#2 Change the new paragraph to say: An XXX command issued subsequent to either 1) a WRITE or WRITEFILEMARK command that returned a VOLUME OVERFLOW or a MEDIUM ERROR, or 2) a VERIFY command that returned a MEDIUM ERROR, MISCOMPARE, FILEMARK, or EOM shall cause any unwritten buffered data or filemarks, if any, to be discarded.

This paragraph would need to be included on the following commands: LOAD/UNLOAD, REWIND, SPACE, ERASE, READ REVERSE, and in MODE SELECT for PAGE CODE 11 (Partitions).

#3 Whatever the solution to the other problems listed in 87-108 are, they could impact the overall flavor of how a system handles fatal errors. I don't think the description is something which belongs in an appendix; but rather, something which deserves immediate reader attention (only for sequential access users though). I suggest that the location of this information be included in a separate paragraph preceding the body of section 9, following the table of contents; or, I suggest that the table of contents have a column which indicates those commands which will end extended contingent allegiance (but then you will need to describe what that is, somewhere).

I thank you for your attention to this matter.

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