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To : John Lohmeyer, Chairman, X3T9.2

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Subject: SCSI-2 91-043 R00 Written Response

The questions posed in Document 91-043 R00 relate to responses in sense data and the tape model. None of the responses below require any change to SCSI-2. A response for the Sequential-Access Density Codes has been covered in a separate document from EXABYTE.

1. Response 1 covers Paragraphs 3 through 5 and relates to the residual count returned when a block of incorrect length is encountered during a READ command specifying fixed length operations.

- The residual count is calculated as  
(Total Blocks Requested - Total Blocks of Expected Length)  
and the logical position is AFTER the block with the incorrect length.
- Whether the block is transferred or not, up to the fixed amount or the short length, is controlled by the TB bit in the READ-WRITE ERROR RECOVERY page of mode data. Note that for unbuffered tape devices cannot prevent transfer of some bytes for the block since their ability to count is directly tied to direct transfer on the SCSI bus. The logical position rule was set to be consistent with these old devices and the residual count represents SUCCESSFUL work based on the command parameters.

A buffered device may have prior knowledge of the next block length and terminate the command before transfer of any bytes of the block in error. However, the logical position is required to be the same.

2. Response 2 covers paragraph 6 and relates to the meaning of "Recovered Error" in sense data.

- Typically, a tape device that can apply read retries within the logical unit and successfully recovers a block of data may continue processing without reporting any error. Such devices usually have LOG SENSE data accumulated for such statistics. Devices without such a log are not required to report recovered error except as covered by the DTE bit in the READ-WRITE ERROR RECOVERY page of mode data.
- If DTE is set to one, the device transfers the "recovered" block and terminates the command with a Recovered Error indication and possibly a residue. If DTE is set to zero, the event is not to be reported (except possibly as logged in log sense data).
- The answer then to how a device reports is really controlled by mode data. Without specific information on a given implementation, it is impossible to tell whether the devices you have tested comply with the standard or not. However, the standard seems fairly clear when all affected sections are analyzed.

3. Response 3 covers paragraph 6 and relates to power-on and reset conditions with a tape volume mounted in the device.

- If a device is truly in a power-on or reset state, the BUSY status is permitted as indicated. The SCSI requirement after POR or reset is for an initial UNIT ATTENTION condition (See Section 6.9). Therefore, a BUS DEVICE RESET message should result in a CHECK CONDITION with a UNIT ATTENTION Sense Key.
- While loading a volume, but not related to a POR or BUS DEVICE RESET, the CHECK CONDITION, NOT READY, LOGICAL UNIT IN THE PROCESS OF BECOMING READY report seems perfectly permissible for any attempt to access the medium or for a TEST UNIT READY command. This does not substitute for the higher requirement of UNIT ATTENTION stated above.

The initiators handling of CHECK CONDITION may be the real problem. If the content of sense data is not analyzed, then incorrect action can result. A NOT READY report should not break an initiator.

- If the tape device is merely rewinding, etc, then by the tape model it is READY. Section 9.1.1, Paragraphs 5 and 6 clearly identify when a logical unit is NOT READY. The model does not include rewinding. The device is defined to be NOT READY when it is loading (threading) or unloading (unthreading) a volume.

Again, it is not possible to determine from the information provided whether this is a logical unit problem, but if these basic definitions are not followed, the logical unit may not be in compliance with the standard.

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