

StorageTek

X3T9.2 / 88 - 022

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To: SCSI Committee X3T9.2

From : Dennis Appleyard

Subject: RECOVER BUFFERED DATA Command for Sequential
Access Type Devices

The operation of the RECOVER BUFFERED DATA command is not completely defined in the SCSI-2 Rev 3 document.

This proposal adds a suppress illegal length indication (SILI) bit to the RECOVER BUFFERED DATA command. This proposal defines operation in variable block mode. It also defines the logical position within the buffer following an illegal length indication (ILI). No method for positioning (spacing) within the buffer exists. For this reason the logical position following error conditions is defined so that the block in error may be recovered with a subsequent RECOVER BUFFERED DATA command. These changes are necessary to allow any initiator in a multiple initiator system to recover all the data from the buffer.

The following changes are proposed to the RECOVER BUFFERED DATA command in the SCSI-2 Rev 3 document.

Byte 1 Bit 1 of the command descriptor block is defined as the suppress illegal length indication (SILI) bit. This is the same position as the SILI bit in the READ command.

The text of the RECOVER BUFFERED DATA command is changed in the following manner:

The RECOVER BUFFERED DATA command (Table 9-12) is used to read data that has been transferred to a target's buffer but has not been written to the medium. It is normally used to recover from error or exception conditions that make it impossible to write the buffered data to the medium.

This command functions similarly to the READ command except that the data is transferred from the target's buffer instead of the medium. The order in which block(s) are transferred is defined by the RBO bit of the MODE SENSE parameters (if that option is supported; see MODE SENSE page 10h) or are transferred the same as if they would have been

transferred to the medium, if the RBO option is not supported. One or more RECOVER BUFFERED DATA commands may be used to read the unwritten buffered data.

Refer to the READ command (9.3) for a definition of the fixed bit and the transfer length.

~~If the fixed bit is set to one and~~ If an attempt is made to recover more logical blocks of data than are contained in the target's buffer, the command shall be terminated with a CHECK CONDITION status. The sense key shall be set to NO SENSE, and the EOM and valid bits shall be set to one in the sense data. The information bytes shall be set to the difference (residue) of the requested transfer length minus the actual number of blocks for bytes depending on the mode of the command transferred.

~~If the fixed bit is set to zero the transfer length indicates the maximum number of bytes transferred from a single block.~~

If the fixed bit is zero, a single block of data shall be transferred from the target's buffer. The transfer length specifies the maximum number of bytes the initiator has allocated for the returned data. If the actual block length is different from the specified transfer length and the suppress illegal length indicator (SILI) bit is zero, CHECK CONDITION status shall be returned to the initiator and the incorrect length indicator (ILI) bit and the valid bit in sense data shall be set to one. The information bytes in the sense data shall be set to the difference (residue) of the requested transfer length minus the actual block length. Targets that do not support negative residues shall set the ILI bit to one and the residue to zero when the actual block length is larger than the transfer length. In any case no more than transfer length bytes shall be transferred to the initiator. In this case the logical position in the buffer is before the block transferred so that the next RECOVER BUFFERED DATA command with the correct transfer length specified may attempt to recover the block. If the fixed bit and the SILI bit are both zero, a block must be completely recovered from the target's buffer (with the correct transfer length specified) before the next block can be recovered. A SILI bit of one indicates that the target shall not return CHECK CONDITION status if the only error is that the transfer length is not equal to the actual length of the block in the buffer. In this case the logical position following the RECOVER BUFFERED DATA command is after the block transferred even if the entire block was not transferred and the next RECOVER BUFFERED DATA command will recover the next block in the buffer.

If the fixed bit is set to one, the transfer length specifies the number of blocks to be transferred to the initiator. This form of the RECOVER BUFFERED DATA command is valid only if the logical unit is currently operating in fixed block mode. Refer to the READ command for a definition of when the logical unit is in fixed block mode.

If the fixed bit is set to one and the block is larger or smaller than the current block length, CHECK CONDITION status shall be returned to the initiator. The ILI bit and the valid bit shall be set to one, and the sense key shall be set to NO SENSE in the sense data. The information bytes shall be set to the difference (residue) of the requested transfer length minus the actual number of blocks transferred (not including the incorrect length block). Upon termination, the logical position in the buffer shall be located before the incorrect length block so that the next RECOVER BUFFERED DATA command may attempt to recover the block without error.

If the fixed bit and the SILI bit are both set to one, the target shall reject the command by returning CHECK CONDITION status and setting the sense key to ILLEGAL REQUEST.

Refer to the READ command for a description of the response if the logical unit encounters a filemark while recovering buffered data.

If the transfer length is zero, no data shall be transferred and the current logical position in the buffer shall not be changed. This is not considered an error.

Please consider incorporating these changes into the next revision level of the SCSI-2 document.