To: INCITS T10 Committee From: Kevin Butt, IBM Date: January 13, 2003 Document: T10/03-018r1 Subject: SSC-2: Information Field Resolution

1. Problem Description

In SSC when an error occured, the INFORMATION field reported was the total number of bytes or blocks in the buffer that were not successfully written to media. If there were a series of commands where FIXED length transfers and variable length transfers were changed, there is no way to determine how many "units" are in the buffer or if those "units" were bytes or blocks. Also, there is no way to know how many are actually in the buffer because it is not known if all blocks made it to the drive (in the case of fixed length transfers of multiple blocks). It is not known by the application client if the drive takes all blocks in before reporting an error or if the blocks are processed as they are sent and when an error occurs the transfers are stopped.

Additionally, on non-WRITE commands, it is not known what to report for deferred errors.

In short, on a write command when there is an error this condition had overloaded the INFOR-MATION field to be information of the current command and information of the buffer state. This overloading of information has made it impossible in many scenarios to give deterministic information. In fact, the definition of this field is "3.1.30 INFORMATION field: A command-specific field in the sense data (see SPC-3)." This states it is a command-specific field.

The SSC-2 WG has had an action for each of us to report on what our various drives report in these scenarios.

2. IBM Tape drive behavior

IBM tape drives will only report the ILI information on non-deferred errors. If there is a deferred error we do not set the ILI bit nor fill in the information field. We force the application client to use Read Postition and other means to determine the location of the media and the number of bytes/blocks in the buffer.

3. Proposed Solution

There is a solution to all of these problems and it has the added benefit of making the INFORMA-TION field valid and useful in all cases. The solution is to make the INFORMATION field command-specific, that is, the INFORMATION field reports information only for the current command that is processed and does not report buffer state. This buffer state only clouds the information such that the values returned are not deterministic and are unreliable. If the INFOR-MATION field relates only to the current command, then the application client knows how many blocks/bytes of its data were transferred to the buffer. It also has the history of previous commands, so it knows what data was received into the buffer. In order to know what data was actually transferred to media, the application client must issue a Read Position command that was designed specifically for this purpose. Indeed today, the application client must use a Read Position to accurately know what made it onto media. This brings clarification without requiring extra effort.

4. Proposed Changes in SSC-2

4.2.11 Error reporting

In the case of a deferred write error the sense data VALID bit shall be set to zero.

5.6 WRITE(16) command

The INFORMATION field shall be set as follows:

- a if the FIXED bit is set to one, the INFORMATION field shall be set to the requested transfer length minus the actual number of logical blocks transferred to the device server;
- b if the FIXED bit is set to zero, the INFORMATION field shall be set to the requested transfer length;

5.7 WRITE FILEMARKS(16) command

The INFORMATION field shall be set to the requested transfer length minus the actual number of filemarks or setmarks:

- a written to the buffer if the immediate bit is set to one, or;
- b written to the medium if the immediate bit is set to zero.

6.8 WRITE(6) command

The INFORMATION field shall be set as follows:

- a if the FIXED bit is set to one, the INFORMATION field shall be set to the requested transfer length minus the actual number of logical blocks transferred to the device server;
- b if the FIXED bit is set to zero, the INFORMATION field shall be set to the requested transfer length;

6.9 WRITE FILEMARKS(6) command

The INFORMATION field shall be set to the requested transfer length minus the actual number of filemarks or setmarks:

- a written to the buffer if the immediate bit is set to one, or;
- b written to the medium if the immediate bit is set to zero.