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To: X3T9.2 Queuing Working Group

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Subject: Proposed SCSI-3 I/O Process Progress Messages

The following proposal provides a way for an initiator to determine the current status or progress of a SCSI I/O Process. At the August Queuing Working Group meeting, someone (I apologize for not getting his name) mentioned the possibility of having some way to determine what queue tags were in use. While not the primary purpose of this proposal, it does provide that ability.

Many SCSI I/O operations provide frequent feedback to the initiator that the target is continuing to work on the operation. For example, with a read operation, reselection and transfer of data informs the initiator that the target is still functioning properly and working on the operation. However, some operations can continue for considerable lengths of time without any feedback to the initiator to confirm that the target is continuing with the operation. One example of such operations is the COPY command. Increased use of I/O Process Queuing will increase the cases where no feedback is available for significant lengths of time. Consider a queued write operations that fetches data from the initiator immediately, then waits a long time in the queue before it can execute.

Operations that do not provide frequent feedback to the initiator confirming continued operation can present problems for rapid detection and recovery from errors. If no other confirmation is available other than the completion of a command, the initiator must wait the worst case time for command completion before initiating recovery. With some operations this can be an undesirably long time.

What we would like is some way an (impatient) initiator can request confirmation that a target is still functioning properly and continuing to work on an I/O Process. Some way that an initiator can ask for the status or progress of an I/O Process. This might include such information as whether the I/O Process is blocked by queue ordering restrictions, whether it has begun execution, how far the current command's execution has progressed, etc. Since this is information about an I/O Process, it seems natural to use the message system for this purpose.

The proposal is to define two new optional messages for SCSI-3, one single byte and one extended. The single byte REQUEST PROGRESS message would be somewhat analogous to the ABORT TAG and similar messages. It would request that the target return the current status or progress of the previously identified I/O

Process. It is legal to request the progress of any tag value, regardless of whether an I/O Process exists for that tag.

The target would use the new extended message to return a four byte message reporting the I/O Process's progress. The high byte would contain the following bit flags:

1. Set if the I/O Process's current command is a linked command.
2. Set if the I/O Process has no yet begun execution.
3. Set if the I/O Process is blocked by a command from the same initiator.
4. Set if the I/O Process is blocked by a command from another initiator on the same bus.
5. Set if the I/O Process is blocked by a command from another bus.

The low three bytes would indicate the amount of work remaining to complete a command that has begun execution. For transfer commands, this would typically be the number of bytes or blocks remaining in the transfer. The precise meaning of the value would be vendor unique. Note that the entire four byte value, treated as an unsigned integer, would be monotonically decreasing during a command's execution.