

Charles Monia  
Digital Equipment Corporation

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From: Charles Monia  
Digital Equipment Corporation

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To: Members of X3T10

Subject: Potential for Out-of-Order Command Execution for Non-interlocked Busses

Background:

In non-interlocked busses, there is the possibility of out-of-order command execution following the termination of a command with BUSY, RESERVATION CONFLICT, TASK SET FULL or ACA ACTIVE status (if returned to the non-faulting initiator).

The problem is that all of the above conditions are transient and may spontaneously disappear without the initiator's knowledge or intervention. Consequently, if the condition goes away following the rejection of a command with one of the above statuses, other commands in transit may be executed. For instance, if an ACA condition caused by initiator A is in effect, commands from initiator B will be terminated with ACA ACTIVE status. Once initiator A clears the condition, other commands from initiator B will execute normally.

Similarly, a TASK SET FULL condition will be automatically cleared as resources for command execution become available. As a result, subsequent commands from the faulted initiator which were in transit may be accepted by the logical unit, resulting in out-of-order command execution.

Proposal:

Modify SAM and all non-interlocked protocols, to define a task set interlock with the following behavior:

1. The interlock is set by the logical unit for a specific initiator, whenever a command from that initiator terminates with a status of BUSY, RESERVATION CONFLICT, TASK SET FULL. or ACA ACTIVE (for the non-faulting initiator).
2. While the interlock is set, subsequent commands from that initiator are returned with a status of TASK SET INTERLOCKED. Commands from other initiators are executed normally.
3. Define a CLEAR TASK SET INTERLOCK task management function in SAM to be implemented by each SCSI protocol.