To: Members of X3T10
From: Charles Monia - Digital Equipment Corporation
Subject: Precedence of SCSI-3 Status (X3T10/94-171R0)

In a multi-initiator environment, there is a potential deadlock, as shown below, which may require a hard reset to clear:

1. Initiator A reserves a logical unit and issues a command which causes a unit attention condition for all initiators.

2. Initiator B sends a command to the logical unit.

3. Instead of terminating the command with a status of RESERVATION CONFLICT, the logical unit chooses to report the unit attention by returning CHECK CONDITION status.

Because of the ACA caused by B, initiator A cannot issue any more commands. Conversely, since the logical unit is reserved by A, initiator B cannot issue a command to clear the condition. If CLEAR ACA is not implemented, the condition will have to be cleared through a hard reset.

In the example, completing the command from B with RESERVATION CONFLICT instead of CHECK CONDITION status would have avoided the problem. The current text in SAM, rev 15, clause 6.6.5 addresses the issue as follows:

"If an initiator issues a command other than INQUIRY or REQUEST SENSE while a UNIT ATTENTION condition exists for that initiator (prior to generating the ACA condition for the unit attention condition), the LUN shall not perform the command and shall report CHECK CONDITION status unless a higher priority status as defined by the LUN is also pending (e.g. BUSY or RESERVATION CONFLICT.)"

I believe this text, which is ambiquous and can be construed to specify optional behavior, should be replaced with the following:

"6.2 Status
....
6.2.1 Status Precedence

If more than one condition applies to a completed task, the report of a BUSY, RESERVATION CONFLICT, ACA ACTIVE or TASK SET FULL status, shall take precedence over the return of any other status for that task."