

To: T10 Technical Committee
 From: Rob Elliott, HP (elliott@hp.com)
 Date: 8 November 2003
 Subject: 03-368r1 SAM-3 Status precedence

Revision history

Revision 0 (31 October 2003) First revision

Revision 1 (8 November 2003) Incorporated comments from November CAP WG.

Related documents

sam3r09 - SCSI Architecture Model - 3 revision 9

spc3r15 - SCSI Primary Commands - 3 revision 15

02-155r6 - Response to T10 letter ballot comments on SAM-2 (Compaq 33 comment)

Overview

During SAM-2 letter ballot comment resolution, the status precedence (section 5.3.2) was modified to allow power on unit attentions to be reported ahead of RESERVATION CONFLICTs. The new wording, though, makes it illegal to return a BUSY or a CHECK CONDITION/ILLEGAL REQUEST ahead of a power on unit attention.

1. The BUSY and TASK SET FULL statuses are usually highest priority of all, since they can reject a command outright without looking at it. Some implementations might let certain commands be processed, so this should not be mandated.

2. The CHECK CONDITION status with ILLEGAL REQUEST sense key should be allowed (but not mandated) to be returned with higher priority than RESERVATION CONFLICT status. If the device server cannot properly parse the CDB, it won't know if a reservation conflict exists.

Some reasons a CHECK CONDITION status ILLEGAL REQUEST sense key might be returned ahead of RESERVATION CONFLICT (with the additional sense code noted):

- a) invalid logical unit number (LOGICAL UNIT NOT SUPPORTED);
- b) invalid task attribute (INVALID MESSAGE ERROR);
- c) unsupported value in the OPERATION CODE field (INVALID COMMAND OPERATION CODE);
- d) unsupported value in the SERVICE ACTION field (INVALID FIELD IN CDB);
- e) unsupported value in the NACA bit in the control byte (INVALID FIELD IN CDB);
- f) a variable length CDB with a problem in its ADDITIONAL CDB LENGTH field (INVALID FIELD IN CDB);
- g) a CDB that is the wrong size for the operation code (e.g. a START STOP UNIT CDB which doesn't even have a START bit);

Other checks that are related to actually processing the command might return ILLEGAL REQUEST with lower priority than RESERVATION CONFLICT (e.g., parameter data problems), so this status/sense key combination also needs to be allowed at a lower priority.

3. A priority between ACA ACTIVE and RESERVATION CONFLICT should be selected. Both conditions could apply simultaneously. Since ACA is more of a "temporary" problem, it should have higher priority.

Suggested changes to SAM-3

5.3.2 Status precedence

~~If more than one condition applies to a completed task, the precedence for deciding the condition to be reported shall be:~~

- ~~1) Reporting a CHECK CONDITION status for any of the following unit attention conditions:~~
 - ~~A) POWER ON, RESET, OR BUS DEVICE RESET OCCURRED;~~
 - ~~B) POWER ON OCCURRED;~~
 - ~~C) SCSI BUS RESET OCCURRED;~~
 - ~~D) BUS DEVICE RESET FUNCTION OCCURRED;~~
 - ~~E) DEVICE INTERNAL RESET;~~
 - ~~F) TRANSCEIVER MODE CHANGED TO SINGLE-ENDED;~~

- ~~G) TRANSCEIVER MODE CHANGED TO LVD; or~~
- ~~H) I_T NEXUS LOSS OCCURRED;~~
- ~~2) Reporting a_BUSY, RESERVATION CONFLICT, ACA ACTIVE or TASK SET FULL status; and~~
- ~~3) Reporting any other status.~~

~~NOTE 1 - The names of the unit attention conditions listed in the subclause (e.g., SCSI BUS RESET OCCURRED) are based on usage in previous versions of this standard. The use of these unit attention condition names is not to be interpreted as a description of how the unit attention conditions are represented by any given SCSI transport protocol.~~

If a device server detects that more than one of the following conditions applies to a completed task, it shall select the condition to report based on the following precedence:

- 1) a CHECK CONDITION status for any of the following unit attention conditions (i.e., with a sense key of UNIT ATTENTION and an additional sense code of):
 - A) POWER ON, RESET, OR BUS DEVICE RESET OCCURRED;
 - B) POWER ON OCCURRED;
 - C) SCSI BUS RESET OCCURRED;
 - D) BUS DEVICE RESET FUNCTION OCCURRED;
 - E) DEVICE INTERNAL RESET;
 - F) TRANSCEIVER MODE CHANGED TO SINGLE-ENDED;
 - G) TRANSCEIVER MODE CHANGED TO LVD; or
 - H) I_T NEXUS LOSS OCCURRED;
- 2) an ACA ACTIVE status;
- 3) a RESERVATION CONFLICT status; and
- 4) a CHECK CONDITION status for any reason not listed in 1) or a status of:
 - A) GOOD;
 - B) CONDITION MET;
 - C) INTERMEDIATE;
 - D) INTERMEDIATE-CONDITION MET; or
 - E) TASK ABORTED.

NOTE 2 - The names of the unit attention conditions listed in the subclause (e.g., SCSI BUS RESET OCCURRED) are based on usage in previous versions of this standard. The use of these unit attention condition names is not to be interpreted as a description of how the unit attention conditions are represented by any given SCSI transport protocol.

A device server may report a BUSY status, TASK SET FULL status, or a CHECK CONDITION status with a sense key of ILLEGAL REQUEST with any precedence.