

Date: October 25, 1996
To: X3T10 Membership
From: Greg Alvey - Solution Technology
Subject: Proposal for New SCSI-3 "AutoSense" Message

Discussion:

CAM (Section 7.7) discusses AutoSense, but in a way that only saves the upper layers of the system (application client) from having to do the work of building and issuing a REQUEST SENSE command. This still involves another "middle" layer on the host side having to intercept the status (i.e. CHECK CONDITION), building a REQUEST SENSE command, connecting to the faulted device to issue the REQUEST SENSE, returning the sense data, and disconnecting again. This does nothing to reduce overhead on the bus itself.

This proposal is intended to provide a way to reduce bus overhead by delivering the sense data during the same connection as the original faulted command.

AutoSense Data (Sense data delivered automatically) can be returned during the same connection as the faulted command by adding support for one two-byte message, "AUTOSENSE DATA FOLLOWS".

Purpose:

To reduce overhead required to retrieve Sense Data from parallel SCSI devices. This may also apply to other types of physical interconnect systems.

Attachments:

Attachments are provided for proposed changes to SIP, SAM, & SPC.

Proposed changes in SIP:
 Message Section - Add the following:

X.X.X AUTOSENSE DATA FOLLOWS

The AUTOSENSE DATA FOLLOWS message (see table xx) is sent from the target role agent to the initiator role agent, immediately following a CHECK CONDITION or COMMAND TERMINATED status, and requests that the initiator role agent prepare to accept sense data related to the currently faulted command. The target role agent then sends the sense data associated with the faulted command followed immediately by the TASK COMPLETE message.

Any ACA which may have been generated for the faulted command is cleared when the sense data has been transferred, according to the AutoSense rules (see SCSI-3 Architecture Model).

The target role agent shall only use this message for tasks where the Enable AutoSense (EAS) bit has been set to one in the Control byte of the current CDB (see SCSI-3 Architecture Model - Section 5.1.2).

An application client can determine whether a device server implements this message by examining the (ASense) bit in the standard INQUIRY data (see SCSI-3 Primary Commands Standard).

The format of the message is shown below:

AutoSense data follows message format								
	bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
byte 0	Message code (25h - proposed)							
byte 1	Number of Sense Data bytes (following)							

The value in the "Number of Sense Data bytes" field is the number of data bytes that will be transferred immediately after this message.

The contents of the sense data bytes are identical to what would be transferred if a REQUEST SENSE command were issued for the currently faulted command.

Proposed changes in SAM
 SAM - Control Byte (Section 5.1.2) - Add the following:

Change in Control Byte of CDB								
	bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
byte n	VS		Reserved		EAS	NACA	Flag	Link

The EAS (Enable AutoSense) bit is used to control the rules for delivering sense data related to an ACA condition caused by the command. If the EAS bit is one, the device server may use the AutoSense rules (see clause 5.6.4.2) The ability to support a Enable AutoSense value of one is indicated in standard INQUIRY data.

Proposed changes in SPC
 INQUIRY command - Section 7.5.1
 Add the AutoSense (ASense) bit to the Standard INQUIRY data format as shown below:

	bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
byte 3	AERC	TrmTsk	NormACA	ASense	Response data format			

The AutoSense bit (ASense) of one indicates that the device server supports setting the EAS bit to one in the Control Byte of the CDB (as defined in SAM). An ASense bit of zero indicates that the device server does not support setting the EAS bit to one.

The following is what AutoSense MIGHT look like on some SCSI bus analyzer.

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Bus Free Detected
  Arbitration Start      7
  Arb_win                7
                        (Atn Asserted)      ATN
  Selection Start       7  4                  ATN
  Selection Complete
                        (Atn Negated)        ATN
                        ATN
  Message Out           C0
    Command Out         08 00 01 00 01 08    (Enable AutoSense)
    Data In              00 01 02 03 04 05
                        06 07 08 09 0A 0B
                        0C OD OE OF 10 11
    Status In           02                  (Check Condition)
  Message In            25                  (AutoSense Follows)
  Message In            12                  (18 bytes of Sense Data)
    Data In              70 00 02 00 00 00
                        00 0A 00 00 00 00
                        18 01 00 80 00 85
  Message In            00
Bus Free Detected

```