To: T10 Technical Committee
From: Rob Elliott, HP (elliott@hp.com)
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Subject: 07-293r0 SAS-2 Zoning interaction with enclosure services

Revision history
Revision 0 (27 June 2007) First revision

Related documents
sas2r10 - Serial Attached SCSI - 2 (SAS-2) revision 10
ses2r17 - SCSI Enclosure Services - 2 (SES-2) revision 17
07-163r0 SES-2 New element status code (George Penokie, IBM) - incorporated into ses2r17

Overview
07-163 defined a new SES-2 element status code value of “No Access Allowed” to be returned when an element is inaccessible due to zoning. SAS-2 should mention in its application layer chapter when this SES-2 element status code is used (SES-2 doesn’t mention “zoning” by name, since that’s SAS-specific).

Suggested changes

10.1 Application layer overview

The application layer defines SCSI, ATA, and management specific features.

10.2 SCSI application layer

10.2.1 SCSI transport protocol services

10.2.2 Application client error handling

10.2.3 Device server error handling

10.2.4 Task router and task manager error handling

10.2.5 SCSI transport protocol event notifications

10.2.6 SCSI commands

10.2.6.1 INQUIRY command

The vital product data returned by the INQUIRY command (see SPC-4) that shall be returned by a logical unit in a SAS device is described in 10.2.11.

10.2.6.2 MODE SELECT and MODE SENSE commands [moved up to match 10.2.x section numbers]

SAS-specific mode pages accessed with the MODE SELECT and MODE SENSE commands (see SPC-4) are described in 10.2.7.

10.2.6.3 LOG SELECT and LOG SENSE commands

SAS-specific log pages accessed with the LOG SELECT and LOG SENSE commands (see SPC-4) are described in 10.2.8.

10.2.6.4 SEND DIAGNOSTIC and RECEIVE DIAGNOSTIC RESULTS commands

SAS-specific diagnostic pages accessed with the SEND DIAGNOSTIC and RECEIVE DIAGNOSTIC RESULTS commands (see SPC-4) are described in 10.2.9.

Zoning (see 4.9) is applied to SES-2 diagnostic pages as described in 10.2.9.

10.2.6.5 START STOP UNIT command

The power condition states controlled by the START STOP UNIT command (see SBC-3) for a SAS device are described in 10.2.10.

10.2.7 SCSI mode parameters

10.2.8 SCSI log parameters

10.2.9 SCSI diagnostic parameters

10.2.9.1 SCSI diagnostic parameters overview [all new]

Table 1 defines diagnostic pages supported by logical units in SCSI target devices in SAS domains (i.e., with SSP target ports) that support the SEND DIAGNOSTIC or RECEIVE DIAGNOSTIC RESULTS commands.

Table 1 — SSP target port diagnostic pages

Diagnostic page code	Description	Reference
3Fh	Protocol-Specific diagnostic page	10.2.9.2

An enclosure services process (see SES-2) describing elements in a SAS domain that are attached to a zoning expander device with zoning enabled (see 4.9) shall apply the zone permission table when providing access to those elements. Element types that may be subject to zoning include:

a) Device element;
b) Array Device element;
c) Enclosure Services Controller Electronics element;
d) SCC Controller Electronics element;
e) SCSI Port/Transceiver element;
f) SCSI Target Port element;
g) SCSI Initiator Port element;
h) SAS Expander element; and
i) SAS Connector element.

Table 1 defines SCSI enclosure services diagnostic pages supported by logical units in SCSI target devices in SAS domains (e.g., with SSP target ports) that are affected by zoning.

Table 2 — Diagnostic pages affected by zoning

Diagnostic page code	Description	Reference
02h	Enclosure Control diagnostic page	SES-2 and 10.2.9.3
	Enclosure Status diagnostic page	SES-2 and 10.2.9.4
0Ah	Additional Element Status diagnostic page	SES-2 and 10.2.9.5

10.2.9.2 Protocol-Specific diagnostic page [as is]

10.2.9.3 Enclosure Control diagnostic page [all new]

If the SELECT bit is set to one for any element that represents a device attached to an expander phy for which the SAS initiator port performing the SEND DIAGNOSTIC command does not have access according to the zone permission table, the enclosure services process shall terminate the SEND DIAGNOSTIC command with CHECK CONDITION status with the sense key set to ILLEGAL REQUEST and the additional sense code set to INVALID FIELD IN PARAMETER LIST.

10.2.9.4 Enclosure Status diagnostic page [all new]

The enclosure services process shall set the ELEMENT STATUS CODE field to 8h (i.e., No Access Allowed) for each element that represents a device attached to an expander phy for which the SAS initiator port performing the RECEIVE DIAGNOSTIC RESULTS command does not have access according to the zone permission table.

10.2.9.5 Additional Element Status diagnostic page [all new]

The enclosure services process shall set the INVALID bit to one in the Additional Element Status descriptor (see SES-2) for each element that represents a device attached to an expander phy for which the SAS initiator port performing the RECEIVE DIAGNOSTIC RESULTS command does not have access according to the zone permission table.