To: T10 Technical Committee
From: Rob Elliott, HP (elliott@hp.com)
Date: 26 July 2003
Subject: T10/03-267r0 New BROADCAST (SES) primitive

Revision History
Revision 0 (26 July 2003) first revision

Related Documents
03-046r0 Minutes of SAS Protocol WG - Jan 13-14, 2003
sas1r00 - Serial Attached SCSI 1.1 revision 0

Overview
Enclosure management processes in SAS would like a way to report asynchronous events to the initiators. Since AER is no longer defined in SCSI (and had implementation problems anyway), a lighter-weight approach is desired.

A BROADCAST (SES) primitive is proposed. Since primitives don't carry data, SCSI enclosure management software has to poll every enclosure services processor (every SES logical unit) in the SAS domain when it receives one of them. Since a SAS domain may contain multiple enclosures with multiple enclosure services processes, and since different enclosure services processors may choose to broadcast this for different reasons and with different frequencies, software might poll and determine that its corresponding enclosure services process is not the source. This still eliminates the need for routine polling and should lead to faster response to asynchronous events (e.g. overtemperature warnings).

Note: A BROADCAST (VENDOR-SPECIFIC) was proposed and rejected for SAS-1 during T10 letter ballot in the January 13-14 meeting that would have served this purpose, and also allow overloading for non-SES functionality.

No change counter in expanders is appropriate for this BROADCAST, since they are sourced by SCSI targets and SMP probes won't be used to service them (SCSI commands will be used).

Suggested Changes
Rename BROADCAST (RESERVED 0) to BROADCAST (SES).

4.6.6.5 BPP interface
Table 14 — Expander phy to BPP requests
Broadcast Event Notify (SES ~~RESERVED 0~~ Received)
Request to transmit a BROADCAST (SES~~RESERVED 0~~) on all other ports because a BROADCAST (SES~~RESERVED 0~~) was received.

7.2.2 Primitive summary
Table 48 — Primitives not specific to type of connection (part 1 of 2)
Rename BROADCAST (RESERVED 0) to BROADCAST (RESERVED 1).

Add From "T" (since it is from a SCSI enclosure services target)

7.2.3 Primitive encodings
Table 51 — Primitive encoding for primitives not specific to type of connection (part 1 of 2)
Rename BROADCAST (RESERVED 0) to BROADCAST (RESERVED 1).

7.2.5.4 BROADCAST
Table 57 — BROADCAST primitives
BROADCAST (RESERVED 0) ~~Reserved.~~Notification of an asynchronous event from a SCSI enclosure services (SES) logical unit in the SAS domain.

...
BROADCAST (CHANGE) is sent by an expander device to notify SAS initiator ports and other expander devices that a configuration change has occurred. BROADCAST (CHANGE) may also be transmitted by SAS initiator ports. BROADCAST (CHANGE) shall be ignored by SAS target ports.

BROADCAST (SES) is sent by a SAS target port to notify SAS initiator ports that an asynchronous event has occurred in an enclosure, and SSP initiator ports should poll all the SCSI enclosure services logical units in the SAS domain. BROADCAST (SES) shall be ignored by SAS target ports.

BROADCAST (RESERVED CHANGE 0) and BROADCAST (RESERVED CHANGE 1) shall be processed the same as BROADCAST (CHANGE) by SAS ports. ~~BROADCAST (RESERVED 0),~~ BROADCAST (RESERVED 1), BROADCAST (RESERVED 2), BROADCAST (RESERVED 3), and BROADCAST (RESERVED 4) shall be ignored by SAS ports.