To: T10 Technical Committee
From: Tim Symons, PMC-Sierra (Tim_Symons@pmc-sierra.com)
Date: 1 May 2006
Subject: 06-215r1 SAS-2 Zone management proxy device

Revision Information

- Revision 0 : Proposal extracted from 06-019r5 SAS-2 Zoning proposal.
- Revision 1 : Added description for re-election and moved REPORT GENERAL fields to a block at the end of the response. Added general comments for discussion on either distributed or dedicated zone management.

Referenced Document

sas2r03a Serial Attached SCSI – 2 (SAS-2) revision 3
06-019r5 SAS-2 Zoning (Tim Symons, PMC-Sierra)
06-202r1 SAS-2 SMP CONFIGURE ZONE PERMISSION functions (Tim Symons, PMC-Sierra)
06-213r0 SAS-2 REPORT GENERAL (Self Config & Zoning)(Steve Johnson, LSI Logic)

Overview

A ZPSDS consists of multiple zoning expander devices, which may have several management devices attached to it. This proposal is for a single elected active zone proxy device that manages changes to the ZPSDS.

The SMP CONFIGURE ZONE PERMISSION request requires the use of an active zone proxy device to ensure that when the zone permission table is updated by a management device, no other management device can simultaneously attempt to update the ZPSDS, leading to potential inconsistency of zone permission tables in a ZPSDS.

In this proposal a single zoning expander device is elected to act as the active zone proxy device.

Dedicated or distributed managers

During discussion of this topic, there are two options for management configuration;

a) Dedicated Manager : Elected proxy device is the only device allowed to originate SMP zone change requests; or
b) Distributed Management : Any management device may originate an SMP zone change requests, and these shall be set to the active zone proxy device for distribution to the ZPSDS.

	Dedicated Manager	Distributed Management
PROS	Single point of access	Any port can be used to configure the system (pro & con)
	Ensures consistency of configuration	Useful for debug
	The attached manager is the only allowed member of zone group 2 (eliminates need for special group 2)	Zone Group 2 was established to control which ports could be used for management functions
CONS	Management device can only be connected to the elected active zone proxy device	Possible configuration contention due to multiple managers reconfiguring the system form different points in the topology
	User is required to know exactly which physical device in a topology has been elected to the active zone proxy device in order to access and manage the zoned topology.	Any port can be used to configure the system (pro & con)

Editors Note: Referenced proposals currently assume distributed management model, controlled by group 2 – if change is required ensure 06-201, 06-202 and 06-203 and any other proposal using group 2 also align

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[Suggested addition to SAS-2 existing text (included in black), new additional text (included in blue) and changes between revisions shown in red]

3.1 Definitions

3.1.270 active zone proxy device: A zoning expander device that has been elected to serve as the proxy device for SMP CONFIGURE ZONE PERMISSION request in a ZPSDS.

4.8.6 ZPSDS Management

4.8.6.1 Active zone proxy device

The active zone proxy device is a zoning expander device that is elected from the zoning expander devices within a ZPSDS. The active zone proxy SAS address is the only valid destination for the SMP CONFIGURE ZONE PERMISSION request originated by an SMP initiator (see 10.4.3.17 Proposal 06-202r1).

Editors Note: Isn't there a term "SMP management client" that should be used here?

The value of the ZONE PROXY PRIORITY field in each zoning expander device within the ZPSDS is used to elect the active zone proxy device.

Table 1 indicates the significance of priority values in the ZONE PROXY PRIORITY field.

Table 1 - Zone supervisor priority values

ZONE PROXY PRIORITY value	Description
1111b	Highest priority
1110b	Second highest priority
…	…
0001b	Second lowest priority
0000b	Lowest priority

4.8.6.2 Zone proxy device election

During the discovery process a zoning expander device shall evaluate the highest ZONE PROXY PRIORITY value for zoning expander devices with the ZONE ENABLED bit set to one in the REPORT GENERAL response (see 10.4.3.3). If the same ZONE PROXY PRIORITY value is reported by two or more phys or devices, then the highest SAS address is elected. A zone proxy device shall always be elected even if all zoning expander devices have the ZONE PROXY PRIORITY value set to 0000b.

Editors Note: REPORT GENERAL proposal 06-213 defines the ZONE ENABLED bit.

A zoning expander device shall set the ACTIVE ZONE PROXY PRIORITY and ACTIVE ZONE PROXY SAS ADDRESS fields in the SMP REPORT GENERAL response to zero until the active zone proxy election process is complete.

4.8.6.2 Zone proxy device re-election

Any of the following events shall cause re-election of the active zone proxy device:

   a)   the active zone proxy device is removed;
   b)   a device with a higher ZONE PROXY PRIORITY value is added to the topology; or
   c)   a device is reconfigured with a higher ZONE PROXY PRIORITY value.

Each of these events result in BROADCAST (Change) to be originated by the event that caused the change. The discovery process re-elects the active zone proxy device.

10.4.3.2 SMP function response frame format

Table 197 – FUNCTION RESULT field

Code	Name	SMP function(s)	Description
		…	
24h	ZONE PROXY DEVICE BUSY	CONFIGURE ZONE PERMISSION	The active zone proxy device received a new request before it has sent an SMP FINAL REQUEST ACCEPTED response. (i.e. CONFIGURING bit is set to one)
25h	ZONE PROXY DEVICE VIOLATION	CONFIGURE ZONE PERMISSION	The device is not the active zone proxy device and received an SMP CONFIGURE ZONE PERMISSION request.
		…	

10.4.3.3 REPORT GENERAL function

Table 199 defines the response format.

Table 199 - REPORT GENERAL response

Byte\Bit	7	6	5	4	3	2	1	0
…	…							
3	RESPONSE LENGTH (09h)							
…	…							
36	ACTIVE ZONE PROXY PRIORITY				ZONE PROXY PRIORITY			
37	ACTIVE ZONE PROXY SAS ADDRESS							
39								
…	…							

…

The ACTIVE ZONE PROXY PRIORITY field indicates the zone proxy priority of the elected active zone proxy device.

The ZONE PROXY PRIORITY field indicates the zone proxy priority of the zoning expander device.

…

The ACTIVE ZONE PROXY SAS ADDRESS field indicates the SAS address of the elected active zone proxy device. This field shall be set to zero if there is no active zone proxy device.

10.4.3.5 DISCOVER function

…

Table 203 - DISCOVER response

Byte\Bit	7	6	5	4	3	2	1	0
…	…							
60	Reserved				ZONE ADDRESS RESOLVED	ZONE GROUP PERSISTENT	ZONE PARTICIPATING	ZONE ENABLED
61	Reserved				ZONE PROXY PRIORITY			
62	Reserved							
63	ZONE GROUP							
…	…							

…

The ZONE PROXY PRIORITY field indicates the value for priority of the device.

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