To: T10 Technical Committee
From: Tim Symons, PMC-Sierra (Tim_Symons@pmc-sierra.com)
Date: 12 June 2006
Subject: 06-201r2 SAS-2 SMP CONFIGURE PHY ZONE functions

Revision Information

- Revision 0: Proposal extracted from 06-019r5 SAS-2 Zoning proposal.
- Revision 1: Clarification of descriptions and added revised the PHY ZONE CONFIGURATION DESCRIPTOR to align with the DISCOVERY fields. Added reference tables for functions.
- Revision 2: Text revisions to include references to the zone management client lock, load activate and unlock procedure defined in 06-286.

Referenced Documents

sas2r03a Serial Attached SCSI – 2 (SAS-2) revision 3
06-019r5 SAS-2 Zoning (Tim Symons, PMC-Sierra)
06-286r1 SAS-2 Zone Management lock. (Tim Symons, PMC-Sierra)

Overview

Each phy of a zoning expander device has configurable zone attributes, these include:
   a) zone group;
   b) zone group persistent;
   c) zone participating;
   d) zone participating persistent; and
   e) zone address resolved.

The CONFIGURE PHY ZONE function is used by the active zone management client to change the phy attributes. A CONFIGURE PHY ZONE request shall only be originated by the active zone management client (see 06-286).

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

10.4.3.1 SMP function request frame format

Table 196 – SMP functions (FUNCTION **field)**

Code	SMP function	Description	Reference
		…	
94h	CONFIGURE PHY ZONE	Change phy entries within a zone route table	10.4.3.16
		…	

10.4.3.2 SMP function response frame format

Table 198 – FUNCTION RESULT **field**

Code	Name	SMP function(s)	Description
...			
10h	PHY DOES NOT EXIST	DISCOVER, DISCOVER LIST, REPORT PHY ERROR LOG, REPORT PHY SATA, REPORT ROUTE INFORMATION, REPORT PHY EVENT INFORMATION, CONFIGURE ROUTE INFORMATION, PHY CONTROL, PHY TEST FUNCTION, CONFIGURE PHY EVENT INFORMATION CONFIGURE PHY ZONE	The phy specified by the PHY IDENTIFIER field in the SMP request frame does not exist (e.g., the value is not within the range of zero to the value of the NUMBER OF PHYS field reported in the REPORT GENERAL function). The ADDITIONAL RESPONSE BYTES field may be present but shall be ignored.
...			

10.4.3.16 CONFIGURE PHY ZONE function

This function shall be supported by all zone management client devices. A CONFIGURE PHY ZONE request should only be originated by the active zone management client, and is used to configure the zoning attributes for phys in a zoning expander device. If a zoning expander device receives a CONFIGURE PHY ZONE request from a device that is not the active zone management client then the function result shall be SMP ZONE LOCK VIOLATION (see 10.4.3.2).

If an error condition is reported in the CONFIGURE PHY ZONE FUNCTION RESPONSE field then the zone management client may abort the changes by clearing the zone lock, to ignore the shadow register data, and all changes shall be ignored.

When a CONFIGURE PHY ZONE request causes a change to an expander phy configuration then;

    a) if the OPTIMIZED ZONE BROADCAST bit is set to one (see 10.4.3.3), then the zoning expander device shall originate a BROADCAST (Change) on each expander port that has access permission to the expander phy before the change, and after the change based on the zone permission table including the phy with that changed; or

    b) if the OPTIMIZED ZONE BROADCAST bit is set to zero (see 10.4.3.3), then the zoning expander device shall originate a BROADCAST (Change) with access to zone group 1 on all ports.

[Editors Note: The OPTIMIZED ZONE BROADCAST bit is defined in proposal 06-286

Table 1 defines the CONFIGURE PHY ZONE request format.

Table 1 – CONFIGURE PHY ZONE request

Byte\Bit	7	6	5	4	3	2	1	0
0	SMP FRAME TYPE (40h)							
1	FUNCTION (94h)							
2	Reserved							
3	REQUEST LENGTH ((n - 7) / 4)							
4	(MSB)			EXPECTED EXPANDER CHANGE COUNT				
5								(LSB)
6	Reserved							
7	NUMBER OF ZONE PHY CONFIGURATION DESCRIPTORS							
Phy zone configuration descriptor list								
8				Phy zone configuration descriptor (first) (see Table 2)				
11								
…				…				
n - 7				Phy zone configuration descriptor (last) (see Table 2)				
n - 4								
n - 3	(MSB)			CRC				
n								(LSB)

The SMP FRAME TYPE field shall be set to 40h.

The FUNCTION field shall be set to 94h.

The REQUEST LENGTH field specifies the number of dwords that follow, not including the CRC field.

The EXPECTED EXPANDER CHANGE COUNT field is defined in the SMP CONFIGURE GENERAL request (see 10.4.3.10).

The NUMBER OF ZONE PHY CONFIGURATION DESCRIPTORS field specifies the number of phy zone configuration descriptors in the request. If the number of phy zone descriptors exceeds the number of phys of the zoning expand device then the function shall report INVALID REQUEST FRAME LENGTH in the response FUNCTION RESULT field.

Each phy zone configuration descriptor is 4 bytes long and follows the format in Table 2 .

Table 2 - phy zone configuration descriptor

Byte\Bit	7	6	5	4	3	2	1	0
0	PHY INDEX							
1	Reserved (ATTACHED CONFIGURED ZONE PARTICIPATING)	ZONE PARTICIP-ATING PERSISTENT	Reserved (LAST CONFIGURED ZONE PARTICIPATING)	Reserved (CONFIGURED ZONE PARTICIP-ATING)	ZONE ADDRESS RESOLVED	ZONE GROUP PERSISTENT	ZONE PARTICI-PATING	Reserved (ZONE ENABLED)
2	Reserved							
3	ZONE GROUP							

The PHY INDEX specifies the phy to which the phy zone configuration descriptor information is applied. If a PHY index does not exist then the function shall report PHY DOES NOT EXIST in the response FUNCTION RESULT field.

The ZONE PARTICIPATING PERSISTENT bit is defined in 10.4.3.5.

The ZONE ADDRESS RESOLVED bit is defined in 10.4.3.5.

The ZONE GROUP PERSISTENT bit is defined in 10.4.3.5.

The ZONE PARTICIPATING bit is defined in 10.4.3.5.

The ZONE GROUP field contains the value of the ZONE GROUP field in the zone phy information (see 4.8.3.1). Zone group values between 128 and 255, inclusive, are reserved.

The CRC field is defined in 10.4.3.2.

Table 3 defines the response format.

Table 3 – CONFIGURE PHY ZONE response

Byte\Bit	7	6	5	4	3	2	1	0
0	SMP FRAME TYPE (41h)							
1	FUNCTION (94h)							
2	FUNCTION RESULT							
3	RESPONSE LENGTH (00h)							
4	(MSB)			CRC				
7								(LSB)

The SMP FRAME TYPE field shall be set to 41h.

The FUNCTION field shall be set to 94h.

The FUNCTION RESULT field is defined in 10.4.3.2

The RESPONSE LENGTH field shall be set to 00h.

The CRC field is defined in 10.4.3.2.