To: T10 Technical Committee
From: Tim Symons, PMC-Sierra (Tim_Symons@pmc-sierra.com)
Date: 3 August 2006
Subject: 06-201r5 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.
- Revision 3: Text revisions and added function response priority table. Further definition for locked and unlocked usage.
- Revision 4: Revised phy zone configuration descriptor to align with 210r4

Referenced Documents

sas2r05a Serial Attached SCSI – 2 (SAS-2) revision 5a
06-019r5 SAS-2 Zoning (Tim Symons, PMC-Sierra)
06-358r1 SAS-2 Zone Configuration model (Tim Symons, PMC-Sierra)

Overview

The CONFIGURE PHY ZONE function is used by a zone manager to change the zone phy information fields for each phy in a zoning expander device. (See 4.9.3.1). A CONFIGURE PHY ZONE request is only accepted by a zoning expander device when it is locked (See 10.4.3.3).

[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
		…	
8Ah	CONFIGURE PHY ZONE	Changes zone phy information fields	10.4.3.16
		…	

Editors Note: Suggestion: 85h-8Fh could be assigned to zoning functions:
85h: ZONE BROADCAST (already defined)
86h: SMP ZONE LOCK
87h: SMP ZONE ACTIVATE
88h: SMP ZONE UNLOCK
89h: Reserved for zoning SMP functions
8Ah: CONFIGURE PHY ZONE
8Bh: CONFIGURE ZONE PERMISSION
8Ch – 8Fh: Reserved for zoning SMP functions

10.4.3.2 SMP function response frame format

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Table 201 – FUNCTION RESULT **field**

Code	Name	SMP function(s)	Description
		…	
04h	INVALID EXPANDER CHANGE COUNT	… CONFIGURE PHY ZONE	The management device server supports the SMP function, but the EXPECTED EXPANDER CHANGE COUNT field does not match the current expander change count. The ADDITIONAL RESPONSE BYTES may be present but shall be ignored.
		…	
10h	PHY DOES NOT EXIST	… 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.
		…	
21h	ZONE LOCK VIOLATION	… CONFIGURE PHY ZONE	A zoning expander device that is zone locked, receives an SMP request function from a source that is not the active zone manager.
22h	PHY INFORMATION VALUE NOT SUPPORTED	… CONFIGURE PHY ZONE	The phy information value specified by a CONFIGURE PHY ZONE request field is not supported. The ADDITIONAL RESPONSE BYTES may be present but shall be ignored.
		…	

…

Table 202 - Function result priority per SMP Function

SMP Function (per table 197)	SMP Function Result Priority
	…
CONFIGURE PHY ZONE	1) INVALID REQUEST FRAME LENGTH 2) PHY DOES NOT EXIST 3) ZONE LOCK VIOLATION 4) PHY INFORMATION VALUE NOT SUPPORTED 5) INVALID EXPANDER CHANGE COUNT 6) SMP FUNCTION FAILED 7) SMP FUNCTION ACCEPTED
	…

…

10.4.3.xx CONFIGURE PHY ZONE function

This function shall be supported by all zone management clients and all zoning expander devices. A zoning expander device shall have the ZONE LOCKED bit set to one and the CONFIGURE PHY ZONE request shall be originated by the active zone manager for the request to be accepted. When a zoning expander device receives a CONFIGURE PHY ZONE request then:

a) If the zoning expander device has the ZONE LOCKED bit set to one and the request is originated from the active zone manager then the function result should be SMP FUNCTION ACCEPTED (see 10.4.3.2).

b) If the zoning expander device has the ZONE LOCKED bit set to one and the request is originated from a device that is not the active zone manager then the function result should be ZONE LOCK VIOLATION (see 10.4.3.2).

c) If the zoning expander device has the ZONE LOCKED bit set to zero then the function result should be SMP FUNCTION FAILED (see 10.4.3.2).

When a CONFIGURE PHY ZONE request is successful the zoning expander device shall set the CONFIGURING bit to one (see 10.4.3.3). The zone phy information fields are stored in the zoning expander shadow registers until the zoning expander device receives an ACTIVATE request (see 10.4.3.xx).

If a CONFIGURE PHY ZONE request is unsuccessful then the zone manager should originate a new request.

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 IDENTIFIER							
1	Reserved		INSIDE ZPSDS PERSISTENT	REQUESTED INSIDE ZPSDS	ZONE ADDRESS RESOLVED	ZONE GROUP PERSISTENT	Reserved	
2	Reserved							
3	ZONE GROUP							

Editors Note: This format is identical to the DISCOVER response bit ordering
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The PHY IDENTIFIER specifies the phy to which the phy zone configuration descriptor information is applied. If a PHY IDENTIFIER indicates a PHY that does not exist then the function shall report PHY DOES NOT EXIST in the response FUNCTION RESULT field.

The INSIDE ZPSDS PERSISTENT bit is defined in 4.9.3.1. If a zoning expander device does not support ZPSDS persistence then the function shall report PHY INFORMATION VALUE NOT SUPPORTED in the response FUNCTION RESULT field.

The REQUESTED INSIDE ZPSDS bit is defined in 4.9.3.1.

The ZONE ADDRESS RESOLVED bit is defined in 4.9.3.1. If a zoning expander device does not support address resolved zoning or a request to set the ZONE ADDRESS RESOLVED bit to one is not permitted as defined in 4.9.3.1. then the function shall report PHY INFORMATION VALUE NOT SUPPORTED in the response FUNCTION RESULT field.

The ZONE GROUP PERSISTENT bit is defined in 4.9.3.1. If a zoning expander device does not support zone group persistence then the function shall report PHY INFORMATION VALUE NOT SUPPORTED in the response FUNCTION RESULT field.

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.