T10/06-201r6 SAS-2 SMP CONFIGURE ZONE PHY INFORMATION function.

To: T10 Technical Committee
From: Tim Symons, PMC-Sierra (Tim_Symons@pmc-sierra.com)
Date: 28 August 2006
Subject: 06-201r6 SAS-2 SMP CONFIGURE ZONE PHY INFORMATION 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
- Revision 5: Text changes per working group conference call.
- Revision 5: Changed function name and additional text changes agreed at Seattle working group meeting.

Referenced Documents

sas2r05a Serial Attached SCSI – 2 (SAS-2) revision 5a
06-358r3 SAS-2 Zone Configuration model (Tim Symons, PMC-Sierra)

Overview

The SMP CONFIGURE ZONE PHY INFORMATION 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). An SMP CONFIGURE ZONE PHY INFORMATION 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]

Table 199 - REPORT GENERAL response

Byte\Bit	7	6	5	4	3	2	1	0
…	…							
10	TABLE TO TABLE SUPPOR-TED	Reserved			ZONE ADDRESS RESOLVED SUPPORTED	CONFIG-URES OTHERS	CONFIG-URING	EXTERN-ALLY CONFIG-URABLE ROUTE TABLE
…	…							

…

A ZONE ADDRESS RESOLVED SUPPORTED bit set to one indicates that the zoning expander device supports address resolved zoning. A ZONE ADDRESS RESOLVED SUPPORTED bit set to zero indicates that the zoning expander device does not support address resolved zoning (see 4.9.3.1).
…

10.4.3.1 SMP function request frame format

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

Code	SMP function	Description	Reference
		…	
8Ah	CONFIGURE ZONE PHY INFORMATION	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 ZONE PHY INFORMATION
8Bh: CONFIGURE ZONE PERMISSION
8Ch – 8Fh: Reserved for zoning SMP functions

10.4.3.2 SMP function response frame format

…

Table 201 – FUNCTION RESULT **field**

Code	Name	SMP function(s)	Description
		…	
04h	INVALID EXPANDER CHANGE COUNT	… CONFIGURE ZONE PHY INFORMATION	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 ZONE PHY INFORMATION	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 ZONE PHY INFORMATION	A zoning expander device that is zone locked, receives an SMP request function from a source that is not the active zone manager.
xxh	ZONE PHY INFORMATION VALUE NOT SUPPORTED	CONFIGURE ZONE PHY INFORMATION	The phy information value specified by a CONFIGURE ZONE PHY INFORMATION 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 ZONE PHY INFORMATION	1) INVALID REQUEST FRAME LENGTH 2) PHY DOES NOT EXIST 3) ZONE LOCK VIOLATION 4) ZONE PHY INFORMATION VALUE NOT SUPPORTED 5) INVALID EXPANDER CHANGE COUNT 6) SMP FUNCTION FAILED 7) SMP FUNCTION ACCEPTED
…	

…

10.4.3.xx CONFIGURE ZONE PHY INFORMATION function

This function shall be supported by all zoning expander devices. A zoning expander device shall have the ZONE LOCKED bit set to one and the CONFIGURE ZONE PHY INFORMATION request shall be originated by the active zone manager for the request to be accepted.

When a CONFIGURE ZONE PHY INFORMATION request is successful the zoning expander device shall set the CONFIGURING bit to one (see 10.4.3.3).

SMP zone configuration functions change the zoning expander shadow values and do not become zoning expander active values until the zoning expander device receives an ACTIVATE request (see 10.4.3.xx).

Table 1 defines the CONFIGURE ZONE PHY INFORMATION request format.

Table 1 – CONFIGURE ZONE PHY INFORMATION 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
----

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 specifies the value of the INSIDE ZPSDS PERSISTENT bit in the zone phy information (see 4.9.3.1).

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 (i.e. the ZONE ADDRESS RESOLVED SUPPORTED bit is set to zero in the REPORT GENERAL response) and the ZONE ADDRESS RESOLVED bit is set to one, then the management device server shall return a function result of ZONE PHY INFORMATION VALUE NOT SUPPORTED in the response frame.

The ZONE GROUP PERSISTENT bit specifies the value of the ZONE GROUP PERSISTENT bit in the zone phy information (see 4.9.3.1)

The ZONE GROUP field specifies the value of the ZONE GROUP field in the zone phy information (see 4.9.3.1). Zone group values between 128 and 255, inclusive, are reserved.

The CRC field is defined in 10.4.3.1.

Table 3 defines the response format.

Table 3 – CONFIGURE ZONE PHY INFORMATION 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.