

To: T10 Technical Committee
 From: Steve Johnson LSI Logic (steve.johnson@lsil.com)
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 Subject: 06-214r1 SAS-2 Expander Route Table (CONFIGURE ADDRESS RESOLVED)

Revision history

Revision 0 (1 May 2006) First revision.
 Revision 1 (27 June 2006) Incorporated feedback from May Denver meeting.

Related documents

sas2r04a - Serial Attached SCSI 2 revision 4a

Overview

A SAS 2.0 zoning capable expander may support address resolved and may configure an attached SAS 1.1 port to be configured as an address resolved port. In this case the zoning management client will need to configure zone group for addresses behind the address resolved; the CONFIGURE ADDRESS RESOLVED function is intended for this purpose.

This function is not required for address resolved ports that are connected to an expander that have the REQUEST ADDRESS RESOLVED bit set in the REPORT GENERAL; In this case the self configuring zoning expander will discover the REQUESTED ADDRESS RESOLVED bit is set and discover each of the phys and get the associated attached sas address and zone group.

Suggested changes

Add the CONFIGURE ADDRESS RESOLVED SMP function to section 10.4.3.x SMP functions of the SAS-2. The CONFIGURE ADDRESS RESOLVED function is being proposed to provide a mechanism to program the address resolved sas address and the associated zone group. It provides a list of descriptors that contain the sas address and the zone group. This function should be sent by the zone manager.

Table 1 — SMP functions (FUNCTION field)

Code	SMP function	Description	Reference
00h	REPORT GENERAL	Return general information about the device	10.4.3.3
01h	REPORT MANUFACTURER INFORMATION	Return vendor and product identification	10.4.3.4
02h	READ GPIO REGISTER	See SFF-8485	
03h	<u>REPORT ZONE PERMISSION</u>	<u>Return zone permission table entries</u>	
04h - 0Fh	Reserved for general SMP input functions		
10h	DISCOVER	Return information about the specified phy	10.4.3.5
11h	REPORT PHY ERROR LOG	Return error logging information about the specified phy	10.4.3.6
12h	REPORT PHY SATA	Return information about a phy currently attached to a SATA phy	
13h	REPORT ROUTE INFORMATION	<u>Return route table information for the specified phy</u>	10.4.3.8
14h	REPORT PHY EVENT INFORMATION	Return phy event information for the specified phy	10.4.3.9

Table 1 — SMP functions (FUNCTION field)

Code	SMP function	Description	Reference
<u>15h</u>	<u>REPORT ZONE ROUTE TABLE</u>	<u>Return zone information for each specified phy</u>	
<u>16h</u>	<u>DISCOVER LIST</u>	<u>Return information about the specified list of phys</u>	
<u>17h</u>	<u>REPORT EXPANDER ROUTE TABLE</u>	<u>Return expander route table information</u>	
<u>18h</u> - 1Fh	Reserved for phy-based SMP input functions		
20h - 3Fh	Reserved for SMP input functions		
40h - 7Fh	Vendor specific		
80h	CONFIGURE GENERAL	Configure the device	10.4.3.10
81h	Reserved for a general SMP output function		
82h	WRITE GPIO REGISTER	See SFF-8485	
<u>83h</u>	<u>CONFIGURE ZONE PERMISSION</u>	<u>Change zone permission table information</u>	
84h	Reserved for general SMP output functions		
85h	ZONED BROADCAST	Transmit the specified BROADCAST on the expander ports in the specified zone group(s)	10.4.3.11
86h - 8Fh	Reserved for general SMP output functions		
90h	CONFIGURE ROUTE INFORMATION	Change route table information <u>for the specified phy</u>	10.4.3.11
91h	PHY CONTROL	Request actions by the specified phy	10.4.3.12
92h	PHY TEST FUNCTION	Request a test function by the specified phy	10.4.3.13
93h	CONFIGURE PHY EVENT INFORMATION	Configure phy event information for the specified phy	10.4.3.14
<u>94h</u>	<u>CONFIGURE PHY ZONE</u>	<u>Change phy entries within a zone route table</u>	
<u>95h</u>	<u>CONFIGURE ADDRESS RESOLVED</u>	<u>CONFIGURE ADDRESS RESOLVED information</u>	
<u>96h</u> - 9Fh	Reserved for phy-based SMP output functions		
A0h - BFh	Reserved for SMP output functions		
C0h - FFh	Vendor specific		

10.4.3.x CONFIGURE ADDRESS RESOLVED function

The CONFIGURE ADDRESS RESOLVED function assigns a list of address resolved SAS ADDRESSES to their associated zone group. The list can be in any order. This function should be requested by the zone manager.

NOTE 1 A zoning capable expander may support address resolved and may configure a port attached to a SAS 1.1 expander device as an address resolved port. In this case the zoning management client will need to configure the zone group for addresses behind the address resolved port.

NOTE 2 This function is not required for address resolved ports that are connected to an expander that have the REQUEST ADDRESS RESOLVED bit set in the REPORT GENERAL.

Editor's Note 1: FOR REQUEST ADDRESS RESOLVED bit see proposal 06-303r0 SAS-2 Address Resolved Configuration.

Table 2 defines the CONFIGURE EXPANDER TOUTE TABLE request format.

Table 2 — CONFIGURE ADDRESS RESOLVED request

Byte/Bit	7	6	5	4	3	2	1	0
0	SMP FRAME TYPE (40h)							
1	FUNCTION (95h)							
2	Reserved							
3	REQUEST LENGTH $((n - 7) / 4)$							
4	(MSB)	EXPECTED EXPANDER CHANGE COUNT						(LSB)
5	Reserved							
6	Reserved							
7	Reserved							
8	(MSB)	NUMBER OF DESCRIPTORS						(LSB)
9	Reserved							
10	Reserved							REMOVE ADDRESSES
11	Reserved							
15	Reserved							
CONFIGURE ADDRESS RESOLVED descriptor list								
16	CONFIGURE ADDRESS RESOLVED descriptor (first)							
31	CONFIGURE ADDRESS RESOLVED descriptor (last)							
...	...							
n - 20	CONFIGURE ADDRESS RESOLVED descriptor (last)							
n - 4	Reserved							
n - 3	(MSB)	CRC						(LSB)
n	Reserved							

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

The FUNCTION field shall be set to 95h.

The REQUEST LENGTH field shall be set to $((n - 7) / 4)$.

The EXPECTED EXPANDER CHANGE COUNT field is defined in 10.4.3.13.

A REMOVE ADDRESSES bit set to one specifies that the ADDRESS RESOLVED SAS ADDRESS specified in the list of CONFIGURE ADDRESS RESOLVED descriptors shall be removed from the expander address resolved table if present. A REMOVE ADDRESS RESOLVED ADDRESSES bit set to zero specifies that the ADDRESS RESOLVED SAS ADDRESSES and the zone group, if any, specified in the list of CONFIGURE ADDRESS RESOLVED descriptors shall be added to the expander device address resolved table.

The NUMBER OF DESCRIPTORS field specifies the number of CONFIGURE ADDRESS RESOLVED descriptors in contained in the CONFIGURE ADDRESS RESOLVED list.

The CRC field is defined in 10.4.3.2.

Table 3 defines the CONFIGURE ADDRESS RESOLVED descriptor format.

Table 3 — CONFIGURE ADDRESS RESOLVED descriptor

Byte\Bit	7	6	5	4	3	2	1	0
0	ADDRESS RESOLVED SAS ADDRESS							
7	ADDRESS RESOLVED SAS ADDRESS							
8	Reserved							ZONE GROUP VALID
9	ZONE GROUP							
10	ZONE GROUP							
11	Reserved							

The ADDRESS RESOLVED SAS ADDRESS specifies the sas address to programmed into the expanders address resolved lookup table.

The ZONE GROUP VALID bit specifies if the value in ZONE GROUP field is valid or not. If the ZONE GROUP VALID bit is set to zero then the ZONE GROUP field shall be ignored. If the ZONE GROUP VALID bit is set to one then the value in the ZONE GROUP field is a valid zone group associated with the ADDRESS RESOLVED SAS ADDRESS.

The ZONE GROUP field is defined in 4.8.3.1.

Table 4 defines the response format.

Table 4 — CONFIGURE ADDRESS RESOLVED response

Byte\Bit	7	6	5	4	3	2	1	0
0	SMP FRAME TYPE (41h)							
1	FUNCTION (95h)							
2	FUNCTION RESULT							
3	RESPONSE LENGTH (00h)							
4	(MSB)	CRC						(LSB)
7	CRC							

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

The FUNCTION field shall be set to 95h.

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.