To: T10 Technical Committee
From: Tim Symons, PMC-Sierra (Tim_Symons@pmc-sierra.com)
Date: 2 August 2006
Subject: 06-202r6 SAS-2 SMP CONFIGURE ZONE PERMISSION functions

Revision Information

- Revision 0: Proposal extracted from 06-019r5 SAS-2 Zoning proposal.
- Revision 1: Added further description and function result fields.
- Revision 2: Added rules for devices that receive requests, and more function result fields to provide additional information in responses.
- Revision 3: Changes to accommodate zone management client lock, load, activate & release procedure.
- Revision 4: Revisions per conference call. Added function response priorities, and revised setting of configuring bit to one based on ZONE LOCK request.
- Revision 5:
- Revision 6: Revised zone permission descriptor format for easier manipulation by 32 bit processors.

Referenced Document

sas2r05a Serial Attached SCSI – 2 (SAS-2) revision 5a
06-201r3 SAS-2 SMP Configure phy zone (Tim Symons, PMC-Sierra)
06-286r4 SAS-2 SMP ZONE LOCK (Tim Symons, PMC-Sierra).
06-288r4 SAS-2 SMP ZONE ACTIVATE function (Tim Symons, PMC-Sierra)
06-289r2 SAS-2 SMP ZONE UNLOCK (Tim Symons, PMC-Sierra)
06-358r1 SAS-2 Zone Configuration model (Tim Symons, PMC-Sierra)

Overview

SMP CONFIGURE ZONE PERMISSION is used by the active zone manager to update the access permissions of the zone permission tables of zoning expander devices.

[Suggested addition to SAS-2. Additions to existing text are shown in blue. 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
		…	
8Bh	CONFIGURE ZONE PERMISSION	Change entries within a zone permission table	10.4.3.1x
		…	

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

Table 201 – FUNCTION RESULT **field**

Code	Name	SMP function(s)	Description
		…	
21h	ZONE LOCK VIOLATION	… CONFIGURE ZONE PERMISSION	A zoning expander device that is zone locked, receives an SMP request function from a source that is not the active zone manager.
		…	

…

Table 202 - Function result priority per SMP Function

SMP Function (per table 197)	SMP Function Result Priority
	…
CONFIGURE ZONE PERMISSION	1) INVALID REQUEST FRAME LENGTH 2) ZONE LOCK VIOLATION 3) SMP FUNCTION FAILED 4) SMP FUNCTION ACCEPTED
	…

10.4.3.x CONFIGURE ZONE PERMISSION function

This function shall be supported by all zone management clients and all zoning expander devices. The CONFIGURE ZONE PERMISSION function requests a change to the zone permissions table entries.

A zoning expander device shall only accept a CONFIGURE ZONE PERMISSION request when the ZONE LOCKED bit set to one and the originator is the active zone manager and:
   a) the ZONING ENABLED bit is set to one; or
   b) the ZONING ENABLED bit is set to zero and the PHYSICAL PRESENCE ASSERTED bit it set to one;

If a zoning expander device receives a CONFIGURE ZONE PERMISSION request from a device that is not the active zone manager then the function result shall be ZONE LOCK VIOLATION (see 10.4.3.2).

The active zone management client shall send CONFIGURE ZONE PERMISSION requests all locked zoning expander device within the ZPSDS, and any zoning expander devices that are not part of a ZPSDS that require permission update prior to zone enable being set to one.

Table 1 defines the CONFIGURE ZONE PERMISSION request format.

Table 1 – CONFIGURE ZONE PERMISSION request

Byte\Bit	7	6	5	4	3	2	1	0
0	SMP FRAME TYPE (40h)							
1	FUNCTION (83h)							
2	Reserved							
3	REQUEST LENGTH ((n - 7) / 4)							
4	Reserved							
5								
6	STARTING SOURCE ZONE GROUP INDEX							
7	FINAL REQUEST	NUMBER OF ZONE PERMISSION DESCRIPTORS						
	Zone permission descriptor list							
8	Zone permission descriptor (first)(see Table 2)							
23								
…	…							
n - 20	Zone permission 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 83h.

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

The STARTING SOURCE ZONE GROUP INDEX specifies the first source zone group to be written with the first zone permission descriptor.

A FINAL REQUEST bit set to one specifies that the current request is the last of a sequence of requests. A LAST REQUEST bit set to zero specifies that there is at least one more request frame to be issued by the originator to complete the total configuration change request.

The NUMBER OF ZONE PERMISSION DESCRIPTORS field specifies how many zone permission descriptors follow.

Editors note: Consider use the error condition defined for UNKNOWN DESCRIPTOR LENGTH when it is defined.

Table 2 defines the zone permission descriptor field format.

Table 2 - Zone permission descriptor format

Byte\Bit	7	6	5	4	3	2	1	0
0	ZP[s, 127]							ZP[s, 120]
…	…			Zone permission entries				…
14	ZP[s, 15]							ZP[s, 8]
15	ZP[s, 7] Reserved	ZP[s, 6] Reserved	ZP[s, 5] Reserved	ZP[s, 4] Reserved	ZP[s, 3]	ZP[s, 2]	ZP[s, 1] 1	ZP[s, 0] 0

Table 3 - Zone permission entry descriptor format

Byte\Bit	7	6	5	4	3	2	1	0
0	ZP [s, 7] Ignored	ZP [s, 6] Ignored	ZP [s, 5] Ignored	ZP [s, 4] Ignored	ZP [s, 3]	ZP [s, 2]	ZP[s, 1] 1	ZP[s, 0] 0
1	ZP [s, 15]							ZP [s, 8]
…	…			Zone permission entries				…
15	ZP [s,127]							ZP [s, 120]

The zone permission entry descriptor contains access permission values for a source zone group (s) and destination zone group (d). to preserve symmetry about the ZP[s = d, d = s] table axis, the zoning expander device shall apply the same value to both the source and destination zone groups for the zone permission entries:

a) ZP[s, 1 and 0] shall be ignored;

b) ZP[1 and 0, d] shall be ignored;

c) ZP[s, 2 and 3] shall apply the indicated value to ZP [2 and 3, d];

d) ZP[2 and 3, d] shall apply the indicated value to ZP [s, 2 and 3];

e) ZP[s, 4 thru 7] shall be ignored;

f) ZP[4 thru 7, d] shall be ignored; and

g) ZP[s, 8 to 127] shall apply the indicated value to ZP[8 to 127, d].

h) ZP[8 to 127, d] shall apply the indicated value to ZP[s, 8 to 127].

The CRC field is defined in 10.4.3.2.

The CONFIGURE ZONE PERMISSION response format is defined in Table 4.

Table 4 – CONFIGURE ZONE PERMISSION response

Byte\Bit	7	6	5	4	3	2	1	0
0	SMP FRAME TYPE (41h)							
1	FUNCTION (83h)							
2	FUNCTION RESULT							
3	RESPONSE LENGTH (01h)							
4	Reserved							FINAL
5	Reserved							
7								
8	(MSB)				CRC			
11								(LSB)

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

The FUNCTION field shall be set to 83h.

The FUNCTION RESULT field is defined in 10.4.3.2.

The FINAL field indicates that the response is from a request that had the FINAL REQUEST bit set to one.

The RESPONSE LENGTH field shall be set to 01h.

The CRC field is defined in 10.4.3.1.