

To: T10 Technical Committee
 From: Tim Symons, PMC-Sierra (Tim_Symons@pmc-sierra.com)
 Date: 28 August 2006
 Subject: 06-202r9 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: Text revision
- Revision 6: Text revision
- Revision 7: Revised zone permission descriptor format for easier manipulation by 32 bit processors.
- Revision 8: Remove FINAL REQUEST indicator and added zone descriptor table change for SMP REPORT ZONE PERMISSION function.
- **Revision 9: Clarification of rules for setting bits in the zone permission table.**

Referenced Document

sas2r05b Serial Attached SCSI – 2 (SAS-2) revision 5b
 06-358r3 SAS-2 Zone Configuration model (Tim Symons, PMC-Sierra)

Overview

The SMP CONFIGURE ZONE PERMISSION function is used by the active zone manager to change the zone permission tables values in a zoning expander device (see 4.9.3.3). An SMP CONFIGURE ZONE PERMISSION request is only accepted by a zoning expander device when it is locked (See 10.4.3.3).

 [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
...			
04h	INVALID EXPANDER CHANGE COUNT	CONFIGURE ZONE PERMISSION	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.
...			
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) INVALID EXPANDER CHANGE COUNT 4) SMP FUNCTION FAILED 5) SMP FUNCTION ACCEPTED
...	

10.4.3.x REPORT ZONE PERMISSION function

...

Table 3 defines the zone permission descriptor field format.

Table 3 - Zone permission descriptor format

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

The zone permission descriptor contains all of the zone group permission entries for the source zone group s, referenced from the STARTING SOURCE ZONE GROUP INDEX field in the request and response frames. This information is extracted from the zone permission table (see Table 3).

...

[Start of function Definition: Changes between revisions shown in red]

10.4.3.x CONFIGURE ZONE PERMISSION 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 PERMISSION request shall be originated by the active zone manager for the request to be accepted.

When a CONFIGURE ZONE PERMISSION 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).

The device server shall process the descriptors in order (i.e. a subsequent descriptor overrides a previous value)

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	(MSB)	EXPECTED EXPANDER CHANGE COUNT						(LSB)
5	STARTING SOURCE ZONE GROUP INDEX							
6	STARTING SOURCE ZONE GROUP INDEX							
7	Reserved	NUMBER OF ZONE PERMISSION DESCRIPTORS						
Zone permission descriptor list								
8	Zone permission descriptor (first)(see Table 2)							
23	Zone permission descriptor (first)(see Table 2)							
...	...							
n - 20	Zone permission descriptor (last)(see Table 2)							
n - 4	Zone permission descriptor (last)(see Table 2)							
n - 3	(MSB)	CRC						(LSB)
n	CRC							

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

The STARTING SOURCE ZONE GROUP INDEX specifies the first source zone group (i.e., s) to be written with the first zone permission descriptor (see table 2).

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

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]	Zone permission entries						ZP[s, 120]
...
14	ZP[s, 15]							ZP[s, 8]
15	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] ignored	ZP[s, 0] ignored

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) if s is not equal to 1, then ZP[s, 0] shall be set to zero by the zone manager and ignored by the zoning expander device;
- b) if d is not equal to 1, then ZP[0, d] shall be set to zero by the zone manager and ignored by the zoning expander device;
- c) ZP[s, 1] shall be set to one by the zone manager and ignored by the zoning expander device;
- d) ZP[1, d] shall be set to one by the zone manager and ignored by the zoning expander device;
- e) if s is 2, 3, or greater than 7, then ZP[s, 2 and 3] shall apply the indicated value to ZP [2 and 3, d];
- f) if d is 2, 3, or greater than 7, then ZP[2 and 3, d] shall apply the indicated value to ZP [s, 2 and 3];
- g) if s is not equal to 1, then ZP[s, 4 thru 7] shall be set to zero by the zone manager and ignored by the zoning expander device;
- h) if d is not equal to 1, then ZP[4 thru 7, d] shall be set to zero by the zone manager and ignored by the zoning expander device;
- i) if s is greater than 7, then ZP[s, 8 to 127] shall apply the indicated value to ZP[8 to 127, d]; and
- j) if d is greater than 7, then ZP[8 to 127, d] shall apply the indicated value to ZP[s, 8 to 127].

The CRC field is defined in 10.4.3.1.

The CONFIGURE ZONE PERMISSION response format is defined in Table 3.

Table 3 – 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 (00h)								
4	(MSB)	CRC							
7								(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 RESPONSE LENGTH field shall be set to 01h.

The CRC field is defined in 10.4.3.2.