

To: T10 Technical Committee
 From: Tim Symons, PMC-Sierra (Tim_Symons@pmc-sierra.com)
 Date: 28 Aug 2006
 Subject: 06-286r5 SAS-2 SMP ZONE LOCK.

Revision Information

- Revision 0: First Revision
- Revision 1: Text revisions per discussion.
- Revision 2: Removed time-out references as these belong in the time-out proposal (06-326). Added definition for configuring zoning expanders that are not zone enabled.
- Revision 3: Added EXPANDER CHANGE COUNT and ZONE LOCKED bit to the request and response frames to indicate zoning expander lock status.
- Revision 4: Changed function name. Bits added to REPORT GENERAL to indicate whether persistence bits are supported. The CONFIGURING bit is used to resolve cases where subgroups of zoning expanders are locked.
- **Revisions per 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

A zone manager uses the SMP ZONE LOCK function to lock a zoning expander device, by setting the ZONE LOCKED bit to one. When a zoning expander device has the ZONE LOCKED bit set to one, it may accept SMP zone configuration function requests to change zone configuration values.

 [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
86h	ZONE LOCK	Locks a zoning expander device for zone configuration.	10.4.3.xx
...

 Editors Note: Suggestion: 85h-8Fh could be assigned to zoning functions:
 85h: ZONE BROADCAST (already defined)
 86h: ZONE LOCK
 87h: ZONE ACTIVATE
 88h: 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	... ZONE LOCK	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.
...			
xxh	ZONE LOCK VIOLATION	... ZONE LOCK	A zoning expander device that is zone locked, receives an SMP zone configuration function from a source that is not the active zone manager, or when the zoning expander device is not locked.
...			

...

Table xx - Function result priority per SMP Function

SMP Function (per table 197)	SMP Function Result Priority
...	
ZONE LOCK	1) INVALID REQUEST FRAME LENGTH 2) ZONE LOCK VIOLATION 3) INVALID EXPANDER CHANGE COUNT 4) SMP FUNCTION FAILED 5) SMP FUNCTION ACCEPTED
...	

...

10.4.3.3 REPORT GENERAL function

Table 199 defines the response format.

Table 199 - REPORT GENERAL response

Byte\ Bit	7	6	5	4	3	2	1	0	
...	...								
3	RESPONSE LENGTH (0Bh)								
...	...								
...	...								
36	Reserved		ZONE LOCKED	PHYSICAL PRESENCE SUPPORTED	PHYSICAL PRESENCE ASSERTED	ZONING SUPPORTED	ZONING ENABLED		
...	...								
40	ZONE LOCKED SAS ADDRESS								
47									
48	(MSB)	CRC							
51								(LSB)	

...

The RESPONSE LENGTH field shall be set to (0Bh).

...

A CONFIGURING bit set to one indicates:

- a) that the management device server is in a self-configuring expander device, the self-configuring expander device's management application client is currently performing the discover process (see 4.7), and it has identified at least one change to its expander routing table; or
- b) the zoning expander device is locked and zoning expander shadow values are different from the zoning expander active values.

A CONFIGURING bit set to zero indicates that the management device server is not in a self-configuring expander device currently performing the discover process and changing its expander routing table. Changes in this bit from one to zero result in a Broadcast (Change) being originated (see 7.11). Management device servers in self-configuring expander devices shall support this bit. Management device servers in externally configurable expander devices and in other device types shall set the CONFIGURING bit to zero.

...

A ZONE LOCKED bit set to one indicates that the zoning expander device is locked (see 10.4.3.x). A ZONE LOCKED bit set to zero indicates that the zoning expander device is not locked.

 Editors Note: Reference SMP ZONE LOCK function

...

The ZONE LOCKED SAS ADDRESS field indicates the SAS address of the zone manager that last locked the zoning expander device. If the zoning expander device is configured by a vendor unique out-of-band method then the ZONE LOCKED SAS ADDRESS field shall be set to zero. (See 4.9.1). This field shall be set to zero at power on.

...

 Start of new definitions. Changes between revisions are shown in red

10.4.3.x ZONE LOCK function

All zoning expander devices shall support this function. A zone manager originates a ZONE LOCK request to lock a group of one or more zoning expander devices.

A ZONE LOCK request should be successful when the zoning expander device has:

- a) the ZONING ENABLED bit is set to one and the ZONE LOCKED bit is set to zero in any REPORT GENERAL response (see 10.4.3.3);
- b) the ZONING ENABLED bit is set to zero and the PHYSICAL PRESENCE ASSERTED bit is set to one in any REPORT GENERAL response (see 10.4.3.3).; or
- c) the ZONING ENABLED bit is set to one and the ZONE LOCKED bit is set to one and the request originated from the active zone manager; or

If the ZONE LOCK request is successful then;

- a) the ZONE LOCKED SAS ADDRESS field shall be set to the SMP port address of the zone management application client device; and
- b) the ZONE LOCKED bit shall be set to one.

When the ZONE LOCKED bit changes from zero to one the locked zoning expander device sets the zoning expander shadow values equal to the zoning expander active values.

 Editors Note: The zone-locked timer should be restarted if a ZONE LOCK request is received from the active zone manager

Table 1 defines the ZONE LOCK request format.

Table 1 – ZONE LOCK request

Byte\Bit	7	6	5	4	3	2	1	0
0	SMP FRAME TYPE (40h)							
1	FUNCTION (86h)							
2	Reserved							
3	REQUEST LENGTH (01h)							
4	(MSB)	EXPECTED EXPANDER CHANGE COUNT						(LSB)
5								
6	Reserved							
7								
8	(MSB)	CRC						(LSB)
11								

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

The FUNCTION field shall be set to 86h.

The REQUEST LENGTH field shall be set to (01h).

The EXPECTED EXPANDER CHANGE COUNT field is defined in 10.4.3.3

The CRC field is defined in 10.4.3.1.

The ZONE LOCK response format is defined in Table 2.

Table 2 – ZONE LOCK response

Byte\Bit	7	6	5	4	3	2	1	0	
0	SMP FRAME TYPE (41h)								
1	FUNCTION (86h)								
2	FUNCTION RESULT								
3	RESPONSE LENGTH (03h)								
4	Reserved								
7									
8	ZONE LOCKED SAS ADDRESS								
15									
16	(MSB)	CRC							
19								(LSB)	

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

The FUNCTION field shall be set to 86h.

The FUNCTION RESULT field is defined in 10.4.3.2

The RESPONSE LENGTH field shall be set to 02h.

The ZONE LOCKED SAS ADDRESS field is defined in 10.4.3.3

 Editors Note: The ZONE LOCKED SAS ADDRESS field definition is in the changes to REPORT
 GENERAL at the beginning of this document

The CRC field is defined in 10.4.3.2.