



## SCS Engineering Release Notice

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*Phase14 GCA Release Version 14.00.00.00 - SAS2FW\_Phase14 (SCGCQ00300504)*

*(SCGCQ00300504) - Phase14 GCA Release Version 14.00.00.00 - SAS2FW Phase14*  
*(SCGCQ00298944) - Phase14 Beta Release Version 13.250.06.00 - SAS2FW Phase14*  
*(SCGCQ00297575) - Phase14 Beta Release Version 13.250.05.00 - SAS2FW Phase14*  
*(SCGCQ00290323) - Phase14 Beta Release Version 13.250.04.00 - SAS2FW Phase14*  
*(SCGCQ00285240) - Phase14 Alpha Release Version 13.250.03.00 - SAS2FW Phase14*  
*(SCGCQ00278396) - Phase14 Alpha Release Version 13.250.02.00 - SAS2FW Phase14*  
*(SCGCQ00276613) - Phase14 Pre-Alpha Release Version 13.250.01.00 - SAS2FW Phase14*  
*(SCGCQ00269869) - Phase14 Pre-Alpha Release Version 13.250.00.00 - SAS2FW Phase14*



## SCS Engineering Release Notice

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*Phase14 GCA Release Version 14.00.00.00 - SAS2FW\_Phase14 (SCGCQ00300504)*

***Defects=0, Enhancements=0 (Version Change Only)***



## SCS Engineering Release Notice

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*Phase14 Beta Release Version 13.250.06.00 - SAS2FW\_Phase14 (SCGCQ00298944)*

***Defects=0, Enhancements=0 (Version Change Only)***



## SCS Engineering Release Notice

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*Phase14 Beta Release Version 13.250.05.00 - SAS2FW\_Phase14 (SCGCQ00297575)*

### **Change Summary ( Defects=4)**

SCGCQ00280375 (DFCT) - When ios are running with cable break and make (b/w expander and drive), fault 8405 is hit

SCGCQ00283314 (DFCT) - One of the inactive volumes member becomes offline/missing

SCGCQ00290523 (CSET) - 0xC00C fault observed while doing Target Mode Aborts while running IOs

SCGCQ00293509 (CSET) - (GEMINI) Incorrect data length reported for failed target mode transfers



# SCS Engineering Release Notice

Phase14 Beta Release Version 13.250.05.00 - SAS2FW\_Phase14 (SCGCQ00297575)

## Total Defects Resolved (4)

(SCGCQ00280375) Defect 1/4

**HEADLINE:** When ios are running with cable break and make (b/w expander and drive), fault 8405 is hit  
**DESC OF CHANGE:** Adding an extra check for reset in loginfo  
**TO REPRODUCE:** Create Raid1 volume for both SAS and SATA drives. Start ios on both the volumes and run cable breaker on both the volumes with a delay of 6 sec, after sometime we hit 8405 fault.  
**ISSUE DESC:** Write cache is disabled for a missing drive.

(SCGCQ00283314) Defect 2/4

**HEADLINE:** One of the inactive volumes member becomes offline/missing  
**DESC OF CHANGE:** Comparing Maximum no of configs with existing configuration list instead of comparing with config no.  
**TO REPRODUCE:** Create a Raid0 volume on Controller C1 , remove the volume HDD's and do Reset .Repeat this 3 more times to create 4 Raid0 volumes. Now insert 1st volume to controller C2 and do reset now you can see volume is seen as inactive, optimal state .And each hdd will be seen as optimal. Repeat this 3 more times to insert all the volumes to controller c2.  
**ISSUE DESC:** The 4th foreign volume was exceeding the maximum no of configurations

(SCGCQ00290523 - Port of SCGCQ00290519) Defect 3/4

**HEADLINE:** 0xC00C fault observed while doing Target Mode Aborts while running IOs  
**DESC OF CHANGE:** Fixed a timing window in the Target Mode abort cleanup code that could cause the observed fault.  
**TO REPRODUCE:** Run Target Mode IOs and inject or cause Target Mode aborts to occur. For this fault to occur, the IO targeted by the abort must be completing just as the Abort processing is nearly complete.  
**ISSUE DESC:** After failing an aborted Target Mode IO back to the host, the IO was found on the completion queue. The code faults because it doesn't know what to do with an IO that has already completed.

(SCGCQ00293509 - Port of SCGCQ00281690) Defect 4/4

**HEADLINE:** (GEMINI) Incorrect data length reported for failed target mode transfers  
**DESC OF CHANGE:** This change prevents the return of stale data by insuring the transfer count is only filled in to the error reply message if it is a valid transfer count.  
**TO REPRODUCE:** Issue a target assist with an invalid IO index. If you are running IO when this occurs, You'll generally observe a non-zero transfer count even though no data for that message had been moved.  
**ISSUE DESC:** In cases where an invalid IO index is used, a bad virtual port, or a bad devHandle is used in a target mode message the transfer count value in the error reply message could be stale data.



## SCS Engineering Release Notice

Phase14 Beta Release Version 13.250.04.00 - SAS2FW\_Phase14 (SCGCQ00290323)

### **Change Summary ( Defects=15)**

SCGCQ00229135 (DFCT) - RAID1 Volume fails to start resync when a hot plugged hot spare is available

SCGCQ00279967 (DFCT) - (IOP) On exiting PCIe Power management state, some configuration bits are not reset

SCGCQ00283700 (DFCT) - Request Sense Command is showing incorrect data during Send Diagnostic foreground mode Command is issued.

SCGCQ00284265 (DFCT) - pl: SATL: Sense data Valid bit and Information field may not be populated correctly

SCGCQ00285381 (DFCT) - SAS2 IT - Phase 14 – Allocation Length for SCSI MODE SENSE Command is not Handled Properly

SCGCQ00285460 (DFCT) - SAS2 IT : Phase 14 : Cannot abort a background short Self test

SCGCQ00285500 (DFCT) - Truncated Data is Obtained When SCSI Inquiry to VPD Page 0xB0 is Executed

SCGCQ00285864 (DFCT) - Extra 60 Bytes of VPD Page Data is Provided When SCSI Inquiry to VPD Page 0x89 is Executed

SCGCQ00286094 (DFCT) - SATL translation happens in firmware for a Persistent Reservation Command with SA=3 for a Invalid PLL

SCGCQ00286118 (DFCT) - pl: SATL: Translation for foreground SELF TEST CODE field in Self Test Results log is incorrect

SCGCQ00286160 (DFCT) - SAS2 IT - Phase 14 – When SATA Drive is Moved to Standby State via Mode Page(0x1a), ASC/ASCQ is Incorrect for REQUEST SENSE

SCGCQ00286226 (DFCT) - SAS2 IT - Phase 14 – Allocation Length for SCSI READ CAPACITY(16) Command is not Handled Properly

SCGCQ00286904 (DFCT) - ManPage11 NVTime variable needs to be increased for all 2308 B0 and D1 HBAs with MRAM

SCGCQ00269850 (CSET) - PI error reported when PI error detected due to a frame CRC error

SCGCQ00281652 (CSET) - 4101 fault on link break during frame transmission



# SCS Engineering Release Notice

Phase14 Beta Release Version 13.250.04.00 - SAS2FW\_Phase14 (SCGCQ00290323)

## Total Defects Resolved (15)

(SCGCQ00229135)		Defect 1/15
HEADLINE:	RAID1 Volume fails to start resync when a hot plugged hot spare is available	
DESC OF CHANGE:	The phydisk media type is set back to its known media type	
TO REPRODUCE:	Create a RAID1 volume with 2 phydisks and a hot spare , now remove the primary/secondary drive from the volume once the resync starts reboot the system , after resync completes insert the removed drive which is now a hotspare .Remove the drive which was hotspare during the initial process , We see that volume never recovers from degraded state.	
ISSUE DESC:	The discovered phydisk media type is set to unknown media type after rebooting the system.	
(SCGCQ00279967)		Defect 2/15
HEADLINE:	(IOP) On exiting PCIe Power management state, some configuration bits are not reset	
DESC OF CHANGE:	Disabled soft reset capability	
TO REPRODUCE:	Make chip go to and return from D0	
ISSUE DESC:	PCIe specification. This includes returning to the D0 power state from all supported power management states (D1, D2, or D3hot). The PCIe power management NoSoftReset option should be implemented as described in the workaround for this erratum.	
(SCGCQ00283700)		Defect 3/15
HEADLINE:	Request Sense Command is showing incorrect data during Send Diagnostic foreground mode Command is issued.	
DESC OF CHANGE:	Included a fix in the firmware to report the correct sense data for a Request Sense command while drive is still executing the foreground self test.	
TO REPRODUCE:	Issue Send Diagnostic Foreground Self Test command to SATA Drive. Verify that drive is in Self test in progress by executing Test Unit Ready Command. Now execute a request sense SCSI command to the sata drive and verify the sense data is incorrect.	
ISSUE DESC:	Firmware was reporting incorrect sense data information to the host for a Request Sense Command while drive is still executing the foreground self test.	
(SCGCQ00284265)		Defect 4/15
HEADLINE:	pl: SATL: Sense data Valid bit and Information field may not be populated correctly	
DESC OF CHANGE:	If a command fails with an error that translates to Logical Block Out Of Range, populate the Information field with the error LBA reported by the drive and set the Valid bit in sense data.	
TO REPRODUCE:	Don't set the Valid bit in Request Sense sense data if the Information field is not valid. Issue a Read (10) command to a SATA drive with an LBA that exceeds the drive's capacity.  Send a Request Sense command to a SATA drive.	
ISSUE DESC:	In either case, check the Valid bit and Information field in the SCSI sense data returned for the command. If a translated command fails with an ATA error that translates to the SCSI additional sense code Logical Block Out Of Range (0x21), the Valid bit and Information field in the SCSI sense data will not be populated.  If a Request Sense command is sent to a SATA drive, the Valid bit in the returned sense data will be set even if the Information field is not valid.	
(SCGCQ00285381)		Defect 5/15
HEADLINE:	SAS2 IT - Phase 14 – Allocation Length for SCSI MODE SENSE Command is not Handled Properly	
DESC OF CHANGE:	Data underrun was not getting set at proper condition.	
TO REPRODUCE:	Execute a SCSI MODE SENSE with allocation length=0 to SATA drive behind HBA.	
ISSUE DESC:	When Mode Sense SCSI command is executed for SATA drive behind IT HBA with allocation length set to zero. The command is passed with 132 bytes of data been provided. This is incorrect. The command should be passed but NO data shall be transferred. As per SPC4R35 for allocation length, as per 4.3.5.6 An Allocation length of zero specifies that no data shall be transferred. This condition shall not be considered	



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Phase14 Beta Release Version 13.250.04.00 - SAS2FW\_Phase14 (SCGCQ00290323)

as an error.

(SCGCQ00285460) Defect 6/15

**HEADLINE:** SAS2 IT : Phase 14 : Cannot abort a background short Self test  
**DESC OF CHANGE:** SATA background self test active was getting cleared at the completion of Send Diagnostic Background short self test command. This was preventing the successful execution of abort background self test command.  
**TO REPRODUCE:** Issue Send Diagnostic Background short self test command to SATA Drive and issue log sense 10 command to check self test is in progress. Now, execute Abort Background self test command to SATA Drive.  
**ISSUE DESC:** Abort self test fails to abort the send diagnostic background short test.

(SCGCQ00285500) Defect 7/15

**HEADLINE:** Truncated Data is Obtained When SCSI Inquiry to VPD Page 0xB0 is Executed  
**DESC OF CHANGE:** The structure definition for SCSI\_BLOCK\_LIMITS\_PAGE was 62 bytes. The reserved bytes at the end of the structure were two bytes short. Fixed the structure definition.  
**TO REPRODUCE:** Execute a SCSI Inquiry to VPD Page 0xB0 to SATA drive behind HBA  
(sg\_raw -r 1000 /dev/sg2 12 01 b0 ff ff 00)  
**ISSUE DESC:** 64 bytes of data shall be provided for Block Limits VPD Page with Page Length set as 0x3C but only 62 bytes of data is returned even though page length is set as 0x3C

(SCGCQ00285864) Defect 8/15

**HEADLINE:** Extra 60 Bytes of VPD Page Data is Provided When SCSI Inquiry to VPD Page 0x89 is Executed  
**DESC OF CHANGE:** First 60 bytes in ATA Info Page was DMAed first and then again size of ATA info page was DMAed from ATA identify data buffer. Hence total of 632 bytes of data was getting transferred. This has been changed to fix this issue. The amount of data DMAed from the ATA identify buffer equals to size of ATA identify data size.  
**TO REPRODUCE:** Execute a SCSI Inquiry to VPD Page 0x89 to SATA drive behind HBA  
example: (sg\_raw -r 1000 /dev/sg4 12 01 89 ff ff 00)  
**ISSUE DESC:** 572 bytes of data shall be provided for ATA Information VPD Page with Page Length set as 0x238 but 632 bytes of data is returned even though page length is set as 0x238.

(SCGCQ00286094) Defect 9/15

**HEADLINE:** SATL translation happens in firmware for a Persistent Reservation Command with SA=3 for a Invalid PLL  
**DESC OF CHANGE:** SATL translation of PERSISTENT RESERVE OUT command is modified to verify parameter list length field in CDB.  
**TO REPRODUCE:** Execute a PERSISTENT RESERVE OUT SCSI Command with PARAMETER LIST LENGTH > 0x18  
**ISSUE DESC:** Firmware performs SATL translation of SCSI command Persistent Reservation Out though parameter list field has value greater than 0x18.

(SCGCQ00286118) Defect 10/15

**HEADLINE:** pl: SATL: Translation for foreground SELF TEST CODE field in Self Test Results log is incorrect  
**DESC OF CHANGE:** In the Self-Test Results log page, translate SMART self test code 0x81 (foreground short self test) to SCSI Send Diagnostic self test code 0x5 (foreground short self test) instead of 0 (default self test).  
**TO REPRODUCE:** Issue a Send Diagnostic command with Self Test Code of 0x5 to a SATA drive that both supports the SMART feature set and has it enabled. When the command completes, issue a Log Sense command with page code 0x10 to the drive. Check the Self Test Code field in the most recent log parameter indicating completion of the self test.  
**ISSUE DESC:** In the Self-Test Results log page (page code 0x10), a Self-Test Results log parameter indicating completion of a foreground short self test (self test code 0x5) will have a Self Test Code of 0.

(SCGCQ00286160) Defect 11/15

**HEADLINE:** SAS2 IT - Phase 14 – When SATA Drive is Moved to Standby State via Mode Page(0x1a), ASC/ASCQ is





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	Incorrect for REQUEST SENSE
<b>DESC OF CHANGE:</b>	On the successful completion of STANDBY IMMEDIATE command, SATA drive is in standby mode and Sata Drive Spun Down should be true.
<b>TO REPRODUCE:</b>	Execute a Mode Select SCSI Command to Page=0x1a and then execute a Request Sense SCSI Command.
<b>ISSUE DESC:</b>	Execute a Mode Select Command to Power Condition Mode Page with Standby Condition Timer=0x00. This will translate into ATA STAND BY IMMEDIATE command. Verify that drive is in Standby mode by executing READ and TUR which will be failing with check condition. Now execute a request sense SCSI command to the drives which are in standby mode and verify the sense data.

(SCGCQ00286226)		Defect 12/15
<b>HEADLINE:</b>	SAS2 IT - Phase 14 – Allocation Length for SCSI READ CAPACITY(16) Command is not Handled Properly	
<b>DESC OF CHANGE:</b>	Data under run is now handled based on the SCSI IO message frame data length.	
<b>TO REPRODUCE:</b>	Execute a SCSI READ CAPACITY(16) with allocation length=0 to SATA drive behind HBA	
<b>ISSUE DESC:</b>	When Read Capacity(16) command is executed for SATA drive behind IT HBA with allocation length set to zero. The command is passed with 32 bytes of data been provided. This is incorrect. The command should be passed but NO data shall be transferred.	

(SCGCQ00286904)		Defect 13/15
<b>HEADLINE:</b>	ManPage11 NVTime variable needs to be increased for all 2308 B0 and D1 HBAs with MRAM	
<b>DESC OF CHANGE:</b>	Increase NVTime of all SAS2308 to 0x32.	
<b>TO REPRODUCE:</b>	1) sas2parser -defaults [any2308XSDfile] defaults.xml 2) open defaults.xml, scroll to ManPage11, view "NVTime" variable.	
<b>ISSUE DESC:</b>	LSI's 2308 HBAs with MRAM use a 45ns MRAM part.	

(SCGCQ00269850 - Port of SCGCQ00262937)		Defect 14/15
<b>HEADLINE:</b>	PI error reported when PI error detected due to a frame CRC error	
<b>DESC OF CHANGE:</b>	Added code to differentiate between a real PI error and one caused by a frame CRC error.	
<b>TO REPRODUCE:</b>	Corrupt the CRC on a data frame for a PI read command. A PI error will be reported.	
<b>ISSUE DESC:</b>	A frame CRC error is triggering the PI detection hardware as the PI data doesn't match the data in a sector. The PI error was causing the IO to be aborted internally and eventually reported as a PI error. Ideally, a CRC error shouldn't be reported as a PI error, although a retry would have most likely returned good data.	

(SCGCQ00281652 - Port of SCGCQ00262122)		Defect 15/15
<b>HEADLINE:</b>	4101 fault on link break during frame transmission	
<b>DESC OF CHANGE:</b>	Work around a spurious link layer transmit side parity error by altering the handling strategy for these errors: do not fault when a link layer transmit side parity error occurs. Instead, the transmit hardware will invalidate the frame CRC when one of these errors occurs, causing the error to be handled as if it were a CRC error that occurred on the wire.	
<b>TO REPRODUCE:</b>	Run a strenuous write/read/compare test against a pair of interconnected initiator and target mode HBAs while repeatedly disabling and enabling the phys, or breaking the links, connecting the HBAs.	
<b>ISSUE DESC:</b>	A 4101 fault may intermittently occur if a phy is disabled or link is broken while the HBA is transmitting a frame. This may occur in either initiator or target mode.	

**Change Summary ( Defects=23 Enhancements=1)**

- SCGCQ00250019 (DFCT) - IO Unit Page 5 PageLength field is not correct
- SCGCQ00257860 (DFCT) - IR Thunderbolt/Mustang images only support D.1, not B.0 - C.1
- SCGCQ00279972 (DFCT) - (IOP) Update D.1 SBR data to the latest SE specified version
- SCGCQ00280467 (DFCT) - SAS2 FW:Ph14:Spelling Mistakes in UART Iop erflsh command help
- SCGCQ00280725 (DFCT) - (Sata Only) Mode Select (10) to POWER CONDITION Page is Failed When IDLE CONDITION TIMER is Set to Non-Zero Value
- SCGCQ00280727 (DFCT) - (Sata Only) Executing Start Stop Unit to move SATA Drive from Standby to Active doesn't work
- SCGCQ00280880 (DFCT) - SAS2 IT - Phase 14 – Allocation Length for SCSI INQUIRY Command is not Handled Properly
- SCGCQ00282613 (DFCT) - (Sata Only) SCSI command 0x9E with service action 0x00 is not failed by SATL.
- SCGCQ00283312 (DFCT) - SAS2 IT - Phase 14 – Request Sense SCSI Command data is incorrect for a SATA Drive During Standby Power Condition Mode
- SCGCQ00283320 (DFCT) - (Sata Only) READ MEDIA SERIAL NUMBER SCSI Command Return's data for Incorrect SERVICE ACTION field
- SCGCQ00283334 (DFCT) - (Sata Only) Request Sense Command is showing incorrect data during stopped condition
- SCGCQ00283688 (DFCT) - SAS2 IT - Phase 14 – Allocation Length for SCSI READ MEDIA SERIAL NUMBER Command is not Handled Properly
- SCGCQ00283695 (DFCT) - SAS2 IT - Phase 14 – Allocation Length for SCSI LOG SENSE Command is not Handled Properly
- SCGCQ00283697 (DFCT) - 0x265D Fault occurs when Inquiry to page code 0xB1 issued while a drive is under format or self-test.
- SCGCQ00285005 (DFCT) - pl: SATL: Nonzero reserved field during Log Sense (Informational Exceptions) translation
- SCGCQ00260358 (CSET) - (IOP) iopiDynMalloc() returns success even when the value is too large
- SCGCQ00269281 (CSET) - Update Toolbox CLI debug on firmware fault
- SCGCQ00271547 (CSET) - R10/R1E volume Resync is not happening after activating a foreign volume with UNCLEAN shutdown (w/\_CC\_DISABLED)
- SCGCQ00278533 (CSET) - SATL: Bad status value for ATA Passthrough (12/16) commands with multiple FIS PIO transfer
- SCGCQ00279135 (CSET) - A diag reset is issued by the driver when resync starts on a RAID 1 volume.
- SCGCQ00283231 (CSET) - DDR3 initialization failure when exiting self refresh
- SCGCQ00283338 (CSET) - SAS 1.1 drive connected to 2008
- SCGCQ00284507 (CSET) - SAS Phy error counters are not getting incremented on removing direct attached expander
- SCGCQ00283153 (CSET) - Gen3 IR - Optimize resync buffer size for enhanced resync performance on Gen3 controllers.

**Total Defects Resolved (23)****(SCGCQ00250019)** Defect 1/23

**HEADLINE:** IO Unit Page 5 PageLength field is not correct  
**DESC OF CHANGE:** Update size of DMA engine entry field so the structure has correct size. Page length is calculated from the structure size.  
**TO REPRODUCE:** Read IO Unit page 5.  
**ISSUE DESC:** IO Unit Page 5, PageLength field is not correct. It doesn't count 2 DMA engine entries.

**(SCGCQ00257860)** Defect 2/23

**HEADLINE:** IR Thunderbolt/Mustang images only support D.1, not B.0 - C.1  
**DESC OF CHANGE:** Added D1 partial XML after adding C1 XML.  
**TO REPRODUCE:** Put D1 image into C1 or below boards.  
**ISSUE DESC:** IR images with "d" in the name only support D.1 rather than B.0 - D.1.

**(SCGCQ00279972)** Defect 3/23

**HEADLINE:** (IOP) Update D.1 SBR data to the latest SE specified version  
**DESC OF CHANGE:** changed BYTES\_180 to 0xBE  
**TO REPRODUCE:** NA  
**ISSUE DESC:** A new version of SBR is available for Thunderbolt D.1

**(SCGCQ00280467)** Defect 4/23

**HEADLINE:** SAS2 FW:Ph14:Spelling Mistakes in UART lop erflsh command help  
**DESC OF CHANGE:** Modified the spelling mistake of lop erflsh help command.  
**TO REPRODUCE:** Run lop erflsh on Uart.  
**ISSUE DESC:** lop erflsh command help has a spelling mistake.

**(SCGCQ00280725)** Defect 5/23

**HEADLINE:** (Sata Only) Mode Select (10) to POWER CONDITION Page is Failed When IDLE CONDITION TIMER is Set to Non-Zero Value  
**DESC OF CHANGE:** The change was to make the 'idle condition timer' field in Power Condition Page to changeable parameter so that the SATL will ignore any non zero value for this field.  
**TO REPRODUCE:** Send a Mode Select for Power Condition Page with 'Idle Condition Timer' field set to a non zero value to a SATA drive. The scsi command will fail with check condition.  
**ISSUE DESC:** For a SATA drive SCSI command Mode Select to Power Condition Page sent with non zero value in Idle Condition Timer field is failed with Check condition and ASCQ set as invalid field in parameter list. According to SAT spec SATL should ignore any values in that field.

**(SCGCQ00280727)** Defect 6/23

**HEADLINE:** (Sata Only) Executing Start Stop Unit to move SATA Drive from Standby to Active doesn't work  
**DESC OF CHANGE:** A flag that tells if the drive is in 'stand-by' mode was not being cleared after completing the SSU command with power condition active. Change was to clear the flag when the drive is successfully moved to active state.  
**TO REPRODUCE:** Send SSU SCSI command with power condition set to 'Standby' to a SATA drive to move the drive to Stand by Mode.  
Check if the drive is moved to stand by by sending TUR to the drive, it should fail with Check Condition, Sense key as Not Ready.  
Send SSU SCSI command again now with power condition set to 'Active', the command will complete successfully.  
Check again if the drive have moved to active mode by sending TUR and Read/Write SCSI command.  
Observe that the commands still fail with check condition and same sense key.  
**ISSUE DESC:** Executing SSU SCSI command with power condition set as 'Active' to a SATA drive that is already in



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standby mode does not work as all media access commands keep failing.

(SCGCQ00280880) Defect 7/23

**HEADLINE:** SAS2 IT - Phase 14 – Allocation Length for SCSI INQUIRY Command is not Handled Properly  
**DESC OF CHANGE:** Allocation length is being compared while determining the transfer length of inquiry data.  
**TO REPRODUCE:** Execute a SCSI Inquiry with allocation length=0 to SATA drive behind HBA (sg\_raw -r 1k /dev/sg0 12 00 00 00 00 00 )  
**ISSUE DESC:** Inquiry data length was independent of allocation length being passed in the CDB.

(SCGCQ00282613) Defect 8/23

**HEADLINE:** (Sata Only) SCSI command 0x9E with service action 0x00 is not failed by SATL.  
**DESC OF CHANGE:** A check for Service Action field is added to the SATL handling of Read Capacity (16) command to fail the command if the value of this field is anything other than 0x10.  
**TO REPRODUCE:** Send a SCSI command with Read Capacity 16 (opcode 0x9E) but change the service action field of CDB to 0x00, the command will pass instead of failing with check condition.  
**ISSUE DESC:** A SCSI command send to a SATA drive with Opcode 0x9E (Read Capacity (16)) and service action 0x00 is processes successfully instead of failing with Sense Key illegal request and ASC/ASC invalid field in CDB.

(SCGCQ00283312) Defect 9/23

**HEADLINE:** SAS2 IT - Phase 14 – Request Sense SCSI Command data is incorrect for a SATA Drive During Standby Power Condition Mode  
**DESC OF CHANGE:** During Standby and force Standby, FW will set a sata drive standby flag. Based on the flag FW will return additional sense data 5e04.  
**TO REPRODUCE:** Execute SSU command to move the drive into Standby mode ( sg\_raw /dev/sg2 1b 00 00 00 30 00 ) and then execute a Request Sense to SATA Drive ( sg\_requests /dev/sg2 -v -H ).  
**ISSUE DESC:** SCSI Request Sense command to drives in a standby mode doesn't return additional sense data Standby condition activated by command.

(SCGCQ00283320) Defect 10/23

**HEADLINE:** (Sata Only) READ MEDIA SERIAL NUMBER SCSI Command Return's data for Incorrect SERVICE ACTION field  
**DESC OF CHANGE:** In SATL handling of Read Media Serial Number SCSI command a check is added to see if the service action field of the CDB is anything other than 0x01 then the command should fail with Check Condition.  
**TO REPRODUCE:** Send SCSI command Read Media Serial Number to a SATA drive but change the service action field to 0x00, the command will complete successfully returning data instead of failing with check condition.  
**ISSUE DESC:** Read Media Serial Number SCSI command send to a SATA drive with service action field set as 0x00 returns data instead of failing the command.

(SCGCQ00283334) Defect 11/23

**HEADLINE:** (Sata Only) Request Sense Command is showing incorrect data during stopped condition  
**DESC OF CHANGE:** Request Sense SCSI command to a SATA drive during stopped condition is changed to return good status and parameter sense data with expected Sense Key and ASC/ASCQ.  
**TO REPRODUCE:** Bring the SATA drive to stopped power condition by sending a SCSI Start Stop Unit command. Send Request Sense SCSI command after the previous command in successfully completed. Observe that the Request Sense command is failed with Check Condition where Sense Key is No Sense and ASC/ASCQ set as Low power condition on. Expected result is that the Request Sense should complete with Good status and return Sense data with Sense Key as No Sense and ASC/ASCQ as logical unit not ready initialization required.  
**ISSUE DESC:** For a SATA drive during stopped power condition, Request Sense SCSI command returns wrong data.

(SCGCQ00283688) Defect 12/23

**HEADLINE:** SAS2 IT - Phase 14 – Allocation Length for SCSI READ MEDIA SERIAL NUMBER Command is not Handled Properly



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Phase14 Alpha Release Version 13.250.03.00 - SAS2FW\_Phase14 (SCGCQ00285240)

**DESC OF CHANGE:** Allocation length is being compared while determining the transfer length of SCSI READ MEDIA SERIAL NUMBER data.

**TO REPRODUCE:** Execute a SCSI READ MEDIA SERIAL NUMBER with allocation length=0 to SATA drive behind HBA

**ISSUE DESC:** SCSI READ MEDIA SERIAL NUMBER data length was independent of allocation length being passed in the CDB.

(SCGCQ00283695) Defect 13/23

**HEADLINE:** SAS2 IT - Phase 14 – Allocation Length for SCSI LOG SENSE Command is not Handled Properly

**DESC OF CHANGE:** Allocation length is being compared while determining the transfer length of SCSI LOG SENSE data.

**TO REPRODUCE:** Execute a SCSI LOG SENSE with allocation length=0 to SATA drive behind HBA

**ISSUE DESC:** SCSI LOG SENSE data length was independent of allocation length being passed in the CDB.

(SCGCQ00283697) Defect 14/23

**HEADLINE:** 0x265D Fault occurs when Inquiry to page code 0xB1 issued while a drive is under format or self-test.

**DESC OF CHANGE:** Instead of accessing a NULL pointer, set some of the Page 0xB1 contents to 0's (as allowed by the spec).

**TO REPRODUCE:** Start an immediate format to a device.  
Issue Inquiry command with Page Code 0xB1

**ISSUE DESC:** If a device is under Format or Self-Test, we're unable to get Identify Data to fill in Page Code 0xB1. The rest of the pages deal with this case already.

(SCGCQ00285005) Defect 15/23

**HEADLINE:** pl: SATL: Nonzero reserved field during Log Sense (Informational Exceptions) translation

**DESC OF CHANGE:** Clear the request frame before sending the Read Log Ext command.

**TO REPRODUCE:** Send a Log Sense (Informational Exceptions) command to a SATA drive that supports SCT. Capture the SATA traffic with a bus analyzer. Check the contents of the reserved fields in the Read Log Ext command in the SATA trace.

**ISSUE DESC:** The Log Sense (Informational Exceptions, page code 0x2F) translation generates two ATA commands: SMART Return Status followed by Read Log Extended. A reserved field in the second command contains leftover data from the first command.

(SCGCQ00260358 - Port of SCGCQ00260083) Defect 16/23

**HEADLINE:** (IOP) iopiDynMalloc() returns success even when the value is too large

**DESC OF CHANGE:** Changed math so that large values will calculate the correct number of blocks.  
Added a check to return of the number of blocks is too large for the current system.

**TO REPRODUCE:** Pass in a large value like 64MB (even). This will have all zeros in the lower bits resulting in success every time.

**ISSUE DESC:** The logic in iopiDynMalloc() incorrectly returns success when large amounts of memory are requested.

(SCGCQ00269281 - Port of SCGCQ00268561) Defect 17/23

**HEADLINE:** Update Toolbox CLI debug on firmware fault

**DESC OF CHANGE:** Update Toolbox CLI debug on fault with:

- Reposted fault state
- Reposted fault code to doorbell along with the last write
- Fixed recursive fault while handling intentional forced fault by clearing doorbell interrupt so it won't trigger recursive fault.
- Added timeout for about 5 seconds if host does not clear doorbell interrupt where firmware is faulted and is waiting for interrupt cleared.
- Disable CLI debug and doorbell if recursive fault occurs by checking recursive fault flag at doorbell handling in fault routine.

**TO REPRODUCE:** Issue option 55 in Isiutil utility.  
Set firmware to fault.  
Issue Toolbox CLI via doorbell handshake.  
Observe fault state and fault code at doorbell from the host after issuing Toolbox CLI via doorbell handshake.

**ISSUE DESC:** There are a few observation that customer likes to have when using Toolbox CLI on firmware fault state. Intentional fault request triggers recursive fault.





# SCS Engineering Release Notice

Phase14 Alpha Release Version 13.250.03.00 - SAS2FW\_Phase14 (SCGCQ00285240)

## (SCGCQ00271547 - Port of SCGCQ00229652)

Defect 18/23

<b>HEADLINE:</b>	R10/R1E volume Resync is not happening after activating a foreign volume with UNCLEAN shutdown (w/_CC_DISABLED)
<b>DESC OF CHANGE:</b>	Update the NVSRAM high water mark when entering/leaving the resync time slice regardless of whether the destination drive of the resync has write cache enabled or not.
<b>TO REPRODUCE:</b>	Create Raid 10 or 1E RAID volume and roam it to another Gen3 controller with consistency checking disabled. When the volume is activated there will be no progress indicator events received by the host and the resync will not appear to be making progress. Drive LEDs will indicate that the resync is actually in progress and if allowed to finish the volume will be Optimal.
<b>ISSUE DESC:</b>	For RAID types R10 and R1E the progress indicator event is was not being sent to host on 1% completion intervals.

## (SCGCQ00278533 - Port of SCGCQ00271456)

Defect 19/23

<b>HEADLINE:</b>	SATL: Bad status value for ATA Passthrough (12/16) commands with multiple FIS PIO transfer
<b>DESC OF CHANGE:</b>	Set the Status register value in the descriptor equal to the E_Status value contained in the last processed PIO Setup FIS instead of that contained in the first received PIO Setup FIS.
<b>TO REPRODUCE:</b>	Send a Read Sectors ATA command for more than 1 sector to a SATA drive using an ATA Passthrough (12/16) command with the CK_COND bit set in the CDB. Check the Status register value returned in the status descriptor.
<b>ISSUE DESC:</b>	If an ATA Passthrough (12) or (16) command is sent to a SATA drive using PIO Data-In protocol, and the transfer requires multiple PIO Setup/data FIS pairs, and the CK_COND bit is set in the CDB to cause an ATA Status Return descriptor to be returned on command completion, the Status register value found in the descriptor will be incorrect.

## (SCGCQ00279135 - Port of SCGCQ00269340)

Defect 20/23

<b>HEADLINE:</b>	A diag reset is issued by the driver when resync starts on a RAID 1 volume.
<b>DESC OF CHANGE:</b>	When the volume moves from optimal to degraded, and IOs are being run, the current preferred copy can be either primary or secondary. Depending on this, the sync task assigns the primary and alternate copy.  Made changes to assign the primary as the preferred copy for non optimal volumes as the secondary physical disk may not be present.
<b>TO REPRODUCE:</b>	1. Create a RAID 1 volume and wait till BGI completes. 2. Install SLES 11 SP1 64b OS, and mpt driver. 3. Execute write and read command "dd if=/dev/zero of=/dev/sdc oflag=direct &" 20 times from OS. 4. Pull out a drive (primary or secondary) from the RAID1 volume. 5. Wait for 10 minutes. 6. Insert the drive pulled out in step 4. 7. The FW is reset by mptdriver.
<b>ISSUE DESC:</b>	A diag reset is issued by the mpt driver when resync starts on a RAID 1 volume.

## (SCGCQ00283231 - Port of SCGCQ00276592)

Defect 21/23

<b>HEADLINE:</b>	DDR3 initialization failure when exiting self refresh
<b>DESC OF CHANGE:</b>	The library now takes control of the M_RST_N signal for a short time when the exit self refresh flag is set to insure the reset is deasserted before starting the memory controller. This allows proper operation of the CKE clamping logic that has already been implemented on boards.
<b>TO REPRODUCE:</b>	Using several adapter boards, perform cache offload testing over several thousand iterations.
<b>ISSUE DESC:</b>	Failures are sometimes observed at DDR3 initialization when exiting self refresh. These failures are due signal delays caused by contention due to the board CKE clamping logic.

## (SCGCQ00283338 - Port of SCGCQ00260362)

Defect 22/23

<b>HEADLINE:</b>	SAS 1.1 drive connected to 2008
<b>DESC OF CHANGE:</b>	Added extra checks to handle the case where a Gen1 expander sends ChangeCount as 0 in at boot up.
<b>TO REPRODUCE:</b>	Setup: System with LSI SAS9200-8e connected to an enclosure having two SAS 1.1 PMC expanders. The PMC expanders are connected to two x4 ports of the LSI HBA. Steps: 1. Reset an expander (single or alternate) and allow it to reboot. Wait for the complete discovery to happen. 2. Continue the step 1 until the LSI HBA does not discover the connected devices. At 11th iteration, the issue is seen.
<b>ISSUE DESC:</b>	The HBA does not discover the connected devices



## SCS Engineering Release Notice

Phase14 Alpha Release Version 13.250.03.00 - SAS2FW\_Phase14 (SCGCQ00285240)

(SCGCQ00284507 - Port of SCGCQ00231068)

Defect 23/23

<b>HEADLINE:</b>	SAS Phy error counters are not getting incremented on removing direct attached expander
<b>DESC OF CHANGE:</b>	Firmware was resetting the phy immediately after receiving the word sync lost interrupt. This was not allowing hardware to increment the counters. Added code to increment the loss dword count error counter when sync lost interrupt is recieved.
<b>TO REPRODUCE:</b>	Attach an expander to the controller and read the SAS phy error counter through a utility. Remove the expander, wait for a few seconds and read the error counters again and observe that the error counters are not incremented.
<b>ISSUE DESC:</b>	On removing any device connected to a controller phy the SAS PHY error counters should be incremented, which was not happening with phase 11 f/w.



# SCS Engineering Release Notice

Phase14 Alpha Release Version 13.250.03.00 - SAS2FW\_Phase14 (SCGCQ00285240)

## Total Enhancements Implemented (1)

(SCGCQ00283153 - Port of SCGCQ00207724)	Enhancement 1/1
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<b>HEADLINE:</b>	Gen3 IR - Optimize resync buffer size for enhanced resync performance on Gen3 controllers.
<b>NEW FUNCTIONALITY:</b>	Changed the Integrated Raid Firmware (IR FW) heap allocation block descriptor to support allocations greater than 64KB in size.





## SCS Engineering Release Notice

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*Phase14 Alpha Release Version 13.250.02.00 - SAS2FW\_Phase14 (SCGCQ00278396)*

### **Change Summary ( Defects=1)**

*SCGCQ00260366 (DFCT) - IOP SEEPROM DIAG UART command corrupts SBR*



# SCS Engineering Release Notice

Phase14 Alpha Release Version 13.250.02.00 - SAS2FW\_Phase14 (SCGCQ00278396)

## Total Defects Resolved (1)

(SCGCQ00260366)		Defect 1/1
<b>HEADLINE:</b>	IOP SEEPROM DIAG UART command corrupts SBR	
<b>DESC OF CHANGE:</b>	Handle corret byte-addressing SEEPROM access and updated initial offset value.	
<b>TO REPRODUCE:</b>	using the iop seeprom clear command to clear it.  Then "iop seeprom write",  do iop show sbr, before and after. you notice it is off.	
<b>ISSUE DESC:</b>	Uart command "iop seeprom write" writes 1-bytes off to SBR	



## SCS Engineering Release Notice

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*Phase14 Pre-Alpha Release Version 13.250.01.00 - SAS2FW\_Phase14 (SCGCQ00276613)*

### **Change Summary ( Defects=6 Enhancements=1)**

SCGCQ00268527 (DFCT) - Fault 0x2622 will occur if Request Equalization bit is set during PCIe Training

SCGCQ00269969 (DFCT) - Gen2:IR:Phase 14: Fault 8701 hit when a SATA RAID1 Volume roamed to the other port of Controller

SCGCQ00276453 (DFCT) - Library fails to build

SCGCQ00260082 (CSET) - (Hydra) The Ethernet phy doesn't reset properly on the TTM

SCGCQ00264318 (CSET) - (Util) fwhead.exe doesn't support new images and requires unix facilities

SCGCQ00270268 (CSET) - (IOP) BootLoader doesn't initialize new image buffer properly

SCGCQ00264324 (CSET) - (UTILS) Add what utility to repository



# SCS Engineering Release Notice

Phase14 Pre-Alpha Release Version 13.250.01.00 - SAS2FW\_Phase14 (SCGCQ00276613)

## Total Defects Resolved (6)

### (SCGCQ00268527) Defect 1/6

**HEADLINE:** Fault 0x2622 will occur if Request Equalization bit is set during PCIe Training

**DESC OF CHANGE:** Masked the unnecessary interrupts.

**TO REPRODUCE:** Using a PCIe protocol exerciser, set the Request Equalization bit in the PCIe Training Sets. No known systems currently set this bit.

**ISSUE DESC:** Devices supporting Gen3 PCIe speeds can have interrupts occur when PCIe training sets the Request Equalization bit. The interrupt should be masked since firmware intervention is not required. Firmware faults on the unexpected interrupt with the belief that it is an error.

### (SCGCQ00269969) Defect 2/6

**HEADLINE:** Gen2:IR:Phase 14: Fault 8701 hit when a SATA RAID1 Volume roamed to the other port of Controller

**DESC OF CHANGE:** The order of Pd elements in case of a foreign volume is as read from metadata. However for native volumes, the primary is always listed first and this leads to issues when a device is being unhidden.

Made changes to unhide only foreign volume's old devices in loadPhysicalDiskData because for foreign volumes we do not get physdisk information. For native volumes, the physdisk is available and provides information about the previous device. Therefore the old device is unhidden using the this information.

**TO REPRODUCE:**

- 1) Create a RAID1 volume out of 2 SATA drives.
- 2) After the BGI is completed, Roam the volume to another port of the controller. The volume should be roamed within 2 seconds.
- 3) Fault 8701 is hit.

**ISSUE DESC:** Fault 8701 hit when a SATA RAID1 volume is roamed to another port of the controller after the volume is created and BGI completed.  
The Fault 8701 is observed when the volume is roamed within 2 seconds to another port of the controller.

### (SCGCQ00276453) Defect 3/6

**HEADLINE:** Library fails to build

**DESC OF CHANGE:** Fixed the typo that caused the build failure.

**TO REPRODUCE:** None

**ISSUE DESC:** A recent code check-in is preventing the library from building.

### (SCGCQ00260082 - Port of SCGCQ00260079) Defect 4/6

**HEADLINE:** (Hydra) The Ethernet phy doesn't reset properly on the TTM

**DESC OF CHANGE:** This work-around hits the software reset.

**TO REPRODUCE:** Reset several times, each time looking at the DHCP to see if it obtains a valid address.

**ISSUE DESC:** The hardware reset didn't appear to reset the phy properly on the SBA EVT board

### (SCGCQ00264318 - Port of SCGCQ00262970) Defect 5/6

**HEADLINE:** (Util) fwhead.exe doesn't support new images and requires unix facilities

**DESC OF CHANGE:** Changed the script to use standard windows functions like attrib and copy  
Also added the capability to recognize vendor specific extended images.

**TO REPRODUCE:** bld.bat in fwhead

**ISSUE DESC:** The build script for fwhead uses rm which is not available in standard windows systems.

### (SCGCQ00270268 - Port of SCGCQ00247171) Defect 6/6

**HEADLINE:** (IOP) BootLoader doesn't initialize new image buffer properly

**DESC OF CHANGE:** Initialized the entire portion of the buffer used.

**TO REPRODUCE:** NA

**ISSUE DESC:** Code review noted possible future problem. A buffer was not being initialized completely, although the default initialization already initializes it to the proper value.



# SCS Engineering Release Notice

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Phase14 Pre-Alpha Release Version 13.250.01.00 - SAS2FW\_Phase14 (SCGCQ00276613)

## *Total Enhancements Implemented (1)*

(SCGCQ00264324 - Port of SCGCQ00263839)	
<b>HEADLINE:</b>	(UTILS) Add what utility to repository
<b>NEW FUNCTIONALITY:</b>	added what utility source and executable for build verification

Enhancement 1/1

**Change Summary ( Defects=26 Enhancements=22)**

- SCGCQ00251472 (DFCT) - PL: Discovery print too long
- SCGCQ00254531 (DFCT) - SAS2308 doesn't support DPO or FUA
- SCGCQ00257631 (DFCT) - (DDR3) Debug prints of PHY registers is not complete
- SCGCQ00257890 (DFCT) - Debug console appears to hang when an invalid escape sequence is entered
- SCGCQ00258821 (DFCT) - BIOS Page 1 default for BIOSOptions and UEFIVersion need updated
- SCGCQ00259616 (DFCT) - <BoardName> field in Meteor eval board DDR XML file too long
- SCGCQ00260399 (DFCT) - PL: Remove incorrect CR/LF characters
- SCGCQ00264854 (DFCT) - SAS write command may complete successfully if target sends premature response frame
- SCGCQ00264882 (DFCT) - SAS read command may complete successfully after data overrun
- SCGCQ00265379 (DFCT) - PL: SAS Device Page 0 may not return correct values
- SCGCQ00247476 (CSET) - Failing a drive in RAID1 volume having write caching enabled resulted in dereference of a NULL pointer.
- SCGCQ00251512 (CSET) - (Hydra) Overnight build fails due to DDR3 change
- SCGCQ00257616 (CSET) - Controller may fault on bad response with incomplete write data transfer
- SCGCQ00258789 (CSET) - OEM-Boot Information Display Mode has been changed to "-----", should be "Display adapters and all Devices"
- SCGCQ00259191 (CSET) - On simulated Cable pulls, an expander goes missing but no add event is seen when the cables are replugged
- SCGCQ00259555 (CSET) - 4101 fault on rapid phy toggle
- SCGCQ00260020 (CSET) - OEM-Type 1 carriers stuck in boot loader are not flashed from cold power up (they are ok after a reset)
- SCGCQ00260021 (CSET) - HDD Temperature reports Status 3 and Reading 0 before the first Log Sense is received
- SCGCQ00260022 (CSET) - HDD Temperature reporting fails intermittently
- SCGCQ00260023 (CSET) - Box number not updated consistently on HDD Temperature readings
- SCGCQ00262823 (CSET) - 7200 fault occurs when Receive Diagnostic Results (0xA) command fails
- SCGCQ00263258 (CSET) - BIOS Page 1 is missing UEFIVersion field
- SCGCQ00264773 (CSET) - Data corruption seen during TLR
- SCGCQ00265935 (CSET) - (GEMINI) HB Command getting lost
- SCGCQ00266453 (CSET) - 0x6051 Fault happens while doing cable pulls on expanders
- SCGCQ00266460 (CSET) - An expander goes missing during cable pull testing and doesn't come back on subsequent discovery attempts
- SCGCQ00177635 (ENHREQ) - MPI 2.5: report offset of first EEDP error in SCSI IO Reply
- SCGCQ00218764 (ENHREQ) - MPI2: new name for SCSI IO Request Control bits
- SCGCQ00226935 (ENHREQ) - (DDR3) Optimize WL algorithm for better training speed
- SCGCQ00226938 (ENHREQ) - (DDR3) Reduce code size by updating Read Leveling algorithm
- SCGCQ00227491 (ENHREQ) - MPI 2.5: IR - new Raid Action to enable the Fast Path
- SCGCQ00229730 (ENHREQ) - 32MB flash chips support
- SCGCQ00234416 (ENHREQ) - Example NVDATA files to enable support for operation at 1333MT/s and other supported speeds for SAS2208 devices
- SCGCQ00235393 (ENHREQ) - (DDR3) Update SPD data support to Release 21A
- SCGCQ00237169 (ENHREQ) - Increase initiators, expanders and phys for SAS2 channel boards with external connectors
- SCGCQ00241199 (ENHREQ) - PL: Configurable AWT for Expanders
- SCGCQ00243201 (ENHREQ) - While switching the inactive volume to another port of same controller fault 8701 is hit
- SCGCQ00249951 (ENHREQ) - PL: Allow ReportDeviceMissingDelay to be set to 1 sec



## SCS Engineering Release Notice

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*Phase14 Pre-Alpha Release Version 13.250.00.00 - SAS2FW\_Phase14 (SCGCQ00269869)*

SCGCQ00250014 (ENHREQ) - (DDR3) If SPD checksum fails then print the expected checksum  
SCGCQ00250721 (ENHREQ) - MPI2: Update Hard Reset Algorithm with new timings  
SCGCQ00254240 (ENHREQ) - Enable SMART polling in OEM specific firmware builds and NVDATA  
SCGCQ00254443 (ENHREQ) - Add support for 512e drives in IR volumes  
SCGCQ00258327 (ENHREQ) - MPI2: Reserve Product Specific range for Event codes  
SCGCQ00262826 (ENHREQ) - Trace Buffer timestamping ability for host drivers via SCSI IO  
SCGCQ00250563 (CSET) - (HYDRA) Modify ManPage16 data to support chip down DDR in Hydra  
SCGCQ00251844 (CSET) - SATL: Configurable Write Same execution behavior  
SCGCQ00262182 (CSET) - Adjust Max Continuous Operating Temp for OEM specific Mustang HBAs  
SCGCQ00264840 (CSET) - OEM specific: Remove KeyIndex check from Man Page 241

**Total Defects Resolved (26)****(SCGCQ00251472)** Defect 1/26

**HEADLINE:** PL: Discovery print too long  
**DESC OF CHANGE:** Shortened one of the lines used during Discovery so that it no longer wraps when viewed through the UART.  
**TO REPRODUCE:** Cause an SMP to time out. Collect the ring buffer.  
**ISSUE DESC:** A debug print was too long, causing the output to be truncated.

**(SCGCQ00254531)** Defect 2/26

**HEADLINE:** SAS2308 doesn't support DPO or FUA  
**DESC OF CHANGE:** Device specific FUA DPO bit is getting set in Mode Sense Header.  
**TO REPRODUCE:** Connect SATA drives to the controller and boot-up the Linux system. Dmesg shows that SAS2308 controller doesn't support DPO and FUA for attached SATA drives.  
**ISSUE DESC:** Linux dmesg log shows that SAS2308 controller doesn't support DPO and FUA for the attached SATA drives.

**(SCGCQ00257631)** Defect 3/26

**HEADLINE:** (DDR3) Debug prints of PHY registers is not complete  
**DESC OF CHANGE:** Modified algorithm to display the register sets that were missing.  
**TO REPRODUCE:** Perform a debug operation (development level) that prints all PHY registers. You'll note that there are a few sets of registers missing from the output.  
**ISSUE DESC:** When DDR3 library prints all PHY registers there are some sets of registers that are not printed.

**(SCGCQ00257890)** Defect 4/26

**HEADLINE:** Debug console appears to hang when an invalid escape sequence is entered  
**DESC OF CHANGE:** Ignore invalid escape sequences entered at the debug console.  
**TO REPRODUCE:** At a UART prompt, press the 'I' key and then try to enter commands.  
**ISSUE DESC:** If the first character of an escape sequence is entered into the debug console, the console will become unresponsive until a valid escape sequence is completed.

**(SCGCQ00258821)** Defect 5/26

**HEADLINE:** BIOS Page 1 default for BIOSOptions and UEFIVersion need updated  
**DESC OF CHANGE:** Update UEFIVersion and BIOSOptions fields in NVDATA with BIOSOptions - 0x00000004 and UEFIVersion - 0x0214  
**TO REPRODUCE:** Review XSD files  
In a system with UEFI 2.3, when the controller was connected, the HII browser is expected to be present and able to access the HBA and connected drives with it.  
In a system with UEFI 2.1, when the controller was connected, the HII browser is not expected to be present.  
**ISSUE DESC:** BIOSOptions default in .XSD should be 0x00000004, so that bits[2:1] are set to 0x2, in order to set (MPI2 rev U) "If UEFI System BIOS version is greater than the version stored in the UEFIVersion field, the UEFI driver registers the HII with the UEFI System BIOS."  
UEFIVersion should be set to default to 0x0214 in the .XSD file.  
The HII portions of the UEFI BSD code are only supported by newer Systems with newer UEFI versions.

**(SCGCQ00259616)** Defect 6/26

**HEADLINE:** <BoardName> field in Meteor eval board DDR XML file too long  
**DESC OF CHANGE:** Shortened field in NVDATA XML file to be less than 16 characters: <BoardName>2116 Eval w/DDR</BoardName>  
**TO REPRODUCE:** Use SAS2Parser to try and insert NVDATA. See error generated.





# SCS Engineering Release Notice

Phase14 Pre-Alpha Release Version 13.250.00.00 - SAS2FW\_Phase14 (SCGCQ00269869)

**ISSUE DESC:** The <BoardName> field in NVDATA is of type STRING\_16 which is a string limited to 16 characters. Someone added a board name to sas2116eval800ddr.xml that was 19 characters long, so it needs to be shortened.

(SCGCQ00260399) Defect 7/26

**HEADLINE:** PL: Remove incorrect CR/LF characters  
**DESC OF CHANGE:** Checked in the file without the incorrect characters.  
**TO REPRODUCE:** None. No functional change.  
**ISSUE DESC:** A file was checked in with incorrect line feed characters.

(SCGCQ00264854) Defect 8/26

**HEADLINE:** SAS write command may complete successfully if target sends premature response frame  
**DESC OF CHANGE:** Do not complete a write command with good status when a good response frame is received with insufficient ACK balance when TLR is not enabled for the command. Instead, abort it.  
**TO REPRODUCE:** Run a write/read/compare stress test against a SAS target device that sometimes sends a response frame for a write command before data transfer is complete.  
**ISSUE DESC:** If a SAS target device sends a response frame for a write command while data transfer for the command is in progress, the command may be completed to the host with good status.

(SCGCQ00264882) Defect 9/26

**HEADLINE:** SAS read command may complete successfully after data overrun  
**DESC OF CHANGE:** Update the stored cumulative data count value when overrun occurs to ensure that an error is thrown if a good response frame is received for the command before it is aborted.  
**TO REPRODUCE:** If an additional data frame is received for the offending command after the Abort Task request is issued, clear the valid flag so that additional frames with the offending tag are ignored. Run a write/read/compare stress test against a SAS target device while causing data overrun of various sizes on read commands.  
**ISSUE DESC:** If data overrun occurs for a read command to a SAS drive, and the drive sends a response frame with good status for the command, the command may complete to the host with good status.

(SCGCQ00265379) Defect 10/26

**HEADLINE:** PL: SAS Device Page 0 may not return correct values  
**DESC OF CHANGE:** Filled in the PortGroups, DmaGroup, and ControlGroup with current data.  
**TO REPRODUCE:** Cannot currently be reproduced, the defect was found during code inspection.  
**ISSUE DESC:** The PortGroups, DmaGroup, or ControlGroup will not be displayed correctly if they are non zero.

(SCGCQ00247476 - Port of SCGCQ00245750) Defect 11/26

**HEADLINE:** Failing a drive in RAID1 volume having write caching enabled resulted in dereference of a NULL pointer.  
**DESC OF CHANGE:** Saved off a pointer to the volume for a drive as it becomes a member of that volume for use later during this scenario. The pointer was only need during firmware logging of events as they occurred during reproduction of the issue.  
**TO REPRODUCE:** 1) Create RAID1 volume.  
2) While BGI is still in progress fail the secondary drive (the one with write cache enabled).  
**ISSUE DESC:** Failing a drive in RAID volume having write caching enabled resulted in dereference of a NULL pointer. This was the result of the pointer being zeroed just prior to needing it for logging purposes.

(SCGCQ00251512 - Port of SCGCQ00251489) Defect 12/26

**HEADLINE:** (Hydra) Overnight build fails due to DDR3 change  
**DESC OF CHANGE:** Modified else (DDR2 code) to match DDR3 implementation  
**TO REPRODUCE:** build all



# SCS Engineering Release Notice

Phase14 Pre-Alpha Release Version 13.250.00.00 - SAS2FW\_Phase14 (SCGCQ00269869)

**ISSUE DESC:** build all fails

**(SCGCQ00257616 - Port of SCGCQ00237417)**

Defect 13/26

**HEADLINE:** Controller may fault on bad response with incomplete write data transfer

**DESC OF CHANGE:** When completing a write IO with incomplete data transfer with bad status, clean the IO from the transmit hardware to prevent it from accessing an invalid memory address while attempting to service the already-completed IO.

**TO REPRODUCE:** Run heavy write IO against a very large topology of SAS drives. Repeatedly cause multiple drives to send response frames containing sense data for outstanding IOs before the initiator has finished transferring the write data for the IOs.

**ISSUE DESC:** If a SAS drive sends a response frame with response or sense data for a write command before the transfer length specified in the last XferReady frame is satisfied, an 0xD04 or 0x2651 fault may occur.

**(SCGCQ00258789 - Port of SCGCQ00254783)**

Defect 14/26

**HEADLINE:** OEM-Boot Information Display Mode has been changed to "-----", should be "Display adapters and all Devices"

**DESC OF CHANGE:** Change NVDATA BIOS page 3 GlobalFlags from 0x40 to 0x44.

**TO REPRODUCE:** Observe the Global Properties screen in the BIOS+CU.

**ISSUE DESC:** The Global Properties in the BIOS+CU is displaying "-----" for the Boot Information Display Mode. It should be "Display adapters and all devices".

**(SCGCQ00259191 - Port of SCGCQ00242899)**

Defect 15/26

**HEADLINE:** On simulated Cable pulls, an expander goes missing but no add event is seen when the cables are replugged

**DESC OF CHANGE:** A change was made ensure Discovery was completing the Report General step if Discovery is interrupted in this state. This change allows the enclosure handle for the expander to be set to a valid value and thus allows the proper reporting of the add event.

**TO REPRODUCE:** SMP Phy Control Disable and Hard Resets are being sent from a second controller to simulate cable pulls. If Discovery is running and gets interrupted by phys going up/down at just the right time, the missing event can occur.

**ISSUE DESC:** Given the right timing, an expander add event isn't sent when pulling/plugging cables between expanders and/or the controller.

**(SCGCQ00259555 - Port of SCGCQ00239230)**

Defect 16/26

**HEADLINE:** 4101 fault on rapid phy toggle

**DESC OF CHANGE:** Fix a race condition in a workaround for an issue that sometimes causes spurious link layer parity errors on link down or phy not ready.

**TO REPRODUCE:** Repeatedly pull and push a wide cable between the HBA and attached devices or run a test that repeatedly toggles multiple links.

**ISSUE DESC:** A 4101 fault may occur if a controller phy loses dWord sync immediately after it becomes ready while other links are also coming up or going down.

**(SCGCQ00260020 - Port of SCGCQ00259870)**

Defect 17/26

**HEADLINE:** OEM-Type 1 carriers stuck in boot loader are not flashed from cold power up (they are ok after a reset)

**DESC OF CHANGE:** Fix the condition check in bootloader mode.

**TO REPRODUCE:** Cold-boot system with 1 Pilot4 SC stays in Boot-Loader mode on LSI Pkg 2-28. Test failed

**ISSUE DESC:** Cold-boot system with 1 Pilot4 SC stays in Boot-Loader mode on LSI Pkg 2-28. Test failed

**(SCGCQ00260021 - Port of SCGCQ00255178)**

Defect 18/26

**HEADLINE:** HDD Temperature reports Status 3 and Reading 0 before the first Log Sense is received

**DESC OF CHANGE:** Set Status = 2 (Disabled, Present, Not Failed) and Reading = 0xFF until the first log sense command is



# SCS Engineering Release Notice

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received. Then status becomes enabled and temperature is updated with the temperature from the first log sense.

**TO REPRODUCE:** Observe temperature display before first log sense command is received.

**ISSUE DESC:** When a drive is completely removed, the internal structure that tracks that removed drive has temperature set to 0x0. When the drive is reinserted, that temperature would remain 0x0 until the first log sense command is issued to obtain the correct temp. Sensor Status = 3 (Enabled, Present, Not Failed) when Reading = 0.

## (SCGCQ00260022 - Port of SCGCQ00257394) Defect 19/26

**HEADLINE:** HDD Temperature reporting fails intermittently

**DESC OF CHANGE:** Added code to properly clean up IOs sent to monitor hard drive temperature that fail due to hot plug/unplug.

**TO REPRODUCE:** Hot plug/unplug hard drives

**ISSUE DESC:** Hard drive temperature is not reported properly after many hot plug/unplugs.

## (SCGCQ00260023 - Port of SCGCQ00255184) Defect 20/26

**HEADLINE:** Box number not updated consistently on HDD Temperature readings

**DESC OF CHANGE:** Before posting to the buffer, FW should check if the Box number is FF. If it is, read SASDP240 and update the new box number.

**TO REPRODUCE:** Repro steps:  
0. Box (enclosure) is empty  
1. Insert 1 Drive  
2. FW HDD monitoring adds a drive. SASDevice page 240 is read. The Box number is 0xFF (authentication hasn't occurred yet). The highest temp is the temp from the only drive.  
3. Authentication occurs and populates SASDP240 with the correct box number (1).  
4. FW HDD monitoring posts the buffer with the OLD box number (FF). It does NOT re-read SADP240.

Scenario 1 - Switching drives

Switching drives forces topology change/drive add. Because the drive is different, causes new high temp to be obtained, SASDP240 is re-read which populates the correct box number. OCSD posts the buffer with the true box number (and the new high temp)

Scenario 2 Adding a drive to the box that already has one

The box number will only be updated \*IF\* this drive happens to have the high temp. If the original drive is still the highest temp, the box number from step 2 will still be posted as 0xFF (SASDP 240 isn't read).

**ISSUE DESC:** Box number not updated consistently on HDD Temperature readings

## (SCGCQ00262823 - Port of SCGCQ00249683) Defect 21/26

**HEADLINE:** 7200 fault occurs when Receive Diagnostic Results (0xA) command fails

**DESC OF CHANGE:** Reinitialize transfer length and skip count parameters before retrying the command.

**TO REPRODUCE:** Configure the HBA to perform OEM specific enclosure management functions. Connect it to an OEM specific enclosure and cause a Receive Diagnostic Results (0xA) command generated by firmware to fail.

**ISSUE DESC:** If a Receive Diagnostic Results (0xA - Additional Element Status diagnostic page) command generated by firmware fails, the controller may fault with code 7200.

## (SCGCQ00263258 - Port of SCGCQ00258780) Defect 22/26

**HEADLINE:** BIOS Page 1 is missing UEFIVersion field

**DESC OF CHANGE:** Added UEFIVersion field in BIOS page 1.

**TO REPRODUCE:** Open the sas2008eval525.xsd file, scroll to BIOS Page 1, where "Reserved2" is printed, it should say "UEFIVersion" (per MPI2 spec rev U).

**ISSUE DESC:** BIOS Page 1 is missing UEFIVersion field

## (SCGCQ00264773 - Port of SCGCQ00260533) Defect 23/26

**HEADLINE:** Data corruption seen during TLR

**DESC OF CHANGE:** During CommadFrame recovery for a SAS tape/drive as part of TLR, the HWContext->SkipCount was wrongly initialized to zero, which has to be pulled from the SCSI IO->SkipCount.



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**TO REPRODUCE:**

1. Create 1 R1 volume with 2 drives (WT, NRA, DIO with 64k Strip size)
2. Create 1 R60 volume with 2 spans and 4 drives in each span (WB, ARA, DIO with strip size 512k)
3. Create 1 R5 volume with 3 drives (WB, ARA, DIO with strip size 128k)
4. Create 1 R50 volume with 2 spans and 3 drives in each span (WB, ARA, DIO with strip size 256k)
5. Run full init
6. Run chaos on all 4 volumes

Data corruption is seen.

**ISSUE DESC:** Data corruption seen during TLR CommandFrame recovery.

## (SCGCQ00265935 - Port of SCGCQ00257597)

Defect 24/26

**HEADLINE:** (GEMINI) HB Command getting lost

**DESC OF CHANGE:** Enabled wide port targets with greater than two PHY to have the specified wide queue depth, as specified in SAS IO Unit Page 1.

**TO REPRODUCE:** Create heavy IO load with heavy peer traffic in HAMR configuration. HB command will timeout.

**ISSUE DESC:** Under heavy IO load the HB command was sometimes getting lost.

## (SCGCQ00266453 - Port of SCGCQ00255115)

Defect 25/26

**HEADLINE:** 0x6051 Fault happens while doing cable pulls on expanders

**DESC OF CHANGE:** Made a code change that allows the SMP to be matched to the issuing Task Management request, so that the critical frame can be properly freed.

**TO REPRODUCE:** In a very large topology, pull cables to an expander somewhere down the chain.

**ISSUE DESC:** Because the system was out of resources, a critical frame was used to send an SMP for a task management operation. When the SMP times out, the SMP isn't correlated to the TM that used the critical frame. This causes the TM to eventually time out also. When the TM times out, we fault because we've lost track of the critical frame that was in use.

## (SCGCQ00266460 - Port of SCGCQ00255659)

Defect 26/26

**HEADLINE:** An expander goes missing during cable pull testing and doesn't come back on subsequent discovery attempts

**DESC OF CHANGE:** When an SMP timeout causes a top level expander to be marked missing. An indicator is set that forces Discovery to look for the expander again the next time Discovery runs on that port.

**TO REPRODUCE:** Pull the cable between two expanders farther down the topology, some unknown factor has to cause SMP timeouts to occur to the top level expander (3 times in a row) to cause it to be marked missing.

**ISSUE DESC:** SMPs are timing out to the top level expander even though the cable pull was 4 expanders down the chain. The links stay up between the controller and this expander. Discovery doesn't try to discover the direct attached expander again.



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## Total Enhancements Implemented (22)

(SCGCQ00177635) Enhancement 1/22

**HEADLINE:** MPI 2.5: report offset of first EEDP error in SCSI IO Reply

**NEW FUNCTIONALITY:** Added EEDPErrorOffset field to SCSI IO Error Reply.

(SCGCQ00218764) Enhancement 2/22

**HEADLINE:** MPI2: new name for SCSI IO Request Control bits

**NEW FUNCTIONALITY:** Renamed Task Priority field to Command Priority to match SAM-4.

(SCGCQ00226935) Enhancement 3/22

**HEADLINE:** (DDR3) Optimize WL algorithm for better training speed

**NEW FUNCTIONALITY:** The time required to perform Write Leveling is reduced. The values found are the same as before, this is only intended to optimize the speed while still performing the same iterations that were previously performed.

(SCGCQ00226938) Enhancement 4/22

**HEADLINE:** (DDR3) Reduce code size by updating Read Leveling algorithm

**NEW FUNCTIONALITY:** Reduced code size by modifying the format of the Read Leveling code. The algorithm still executes in basically the same manner and finds the same value as would be found before.

(SCGCQ00227491) Enhancement 5/22

**HEADLINE:** MPI 2.5: IR - new Raid Action to enable the Fast Path

**NEW FUNCTIONALITY:** Added new Action for the RAID Action Request: MPI2\_RAID\_ACTION\_PHYSDISK\_HIDDEN

(SCGCQ00229730) Enhancement 6/22

**HEADLINE:** 32MB flash chips support

**NEW FUNCTIONALITY:** Added 32MB option to MPI flash layout

(SCGCQ00234416) Enhancement 7/22

**HEADLINE:** Example NVDATA files to enable support for operation at 1333MT/s and other supported speeds for SAS2208 devices

**NEW FUNCTIONALITY:** Added new example NVDATA files to enable SAS2208 to operate at various DDR3 speeds. The supported speeds are 800, 1066, and 1333.

(SCGCQ00235393) Enhancement 8/22

**HEADLINE:** (DDR3) Update SPD data support to Release 21A

**NEW FUNCTIONALITY:** Updated SPD data support to:  
JEDEC Standard No. 21-C  
Annex K: Serial Presence Detect (SPD) for DDR3 SDRAM Modules  
Release 21A

(SCGCQ00237169) Enhancement 9/22



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**HEADLINE:** Increase initiators, expanders and phys for SAS2 channel boards with external connectors  
**NEW FUNCTIONALITY:** Increase <RESOURCE\_INITIATORS>, <RESOURCE\_EXPANDERS>, <RESOURCE\_PHYS> for Channel boards with external connectors.

(SCGCQ00241199) Enhancement 10/22

**HEADLINE:** PL: Configurable AWT for Expanders  
**NEW FUNCTIONALITY:** Added a new field to Manufacturing Page 11 that allows the Initial Arbitration Wait Timer to be set for edge expanders.

(SCGCQ00243201) Enhancement 11/22

**HEADLINE:** While switching the inactive volume to another port of same controller fault 8701 is hit  
**NEW FUNCTIONALITY:** When devices are roamed from one port to another of the same controller, if the device addition event is received before the corresponding device's removal event, then during device addition, the corresponding device which was not yet removed is unhidden.  
When the device is roamed, the device addition processing takes care of changes in the configuration. Hence the device removal event is not processed for the unhidden device, thus taking care of 8701 fault condition.

(SCGCQ00249951) Enhancement 12/22

**HEADLINE:** PL: Allow ReportDeviceMissingDelay to be set to 1 sec  
**NEW FUNCTIONALITY:** A ReportDeviceMissingDelay of 1 second will no longer result in the firmware changing to the product specific delay setting.

(SCGCQ00250014) Enhancement 13/22

**HEADLINE:** (DDR3) If SPD checksum fails then print the expected checksum  
**NEW FUNCTIONALITY:** During the event of a SPD checksum failure the SPD checksum as well as the calculated (expected) checksum is printed by default without the need to enable extended debug prints.

(SCGCQ00250721) Enhancement 14/22

**HEADLINE:** MPI2: Update Hard Reset Algorithm with new timings  
**NEW FUNCTIONALITY:** Updated timing requirements for performing Hard Reset.

(SCGCQ00254240) Enhancement 15/22

**HEADLINE:** Enable SMART polling in OEM specific firmware builds and NVDATA  
**NEW FUNCTIONALITY:** SATA SMART polling is compiled into OEM specific firmware builds and enabled by default in OEM specific NVDATA.

(SCGCQ00254443) Enhancement 16/22

**HEADLINE:** Add support for 512e drives in IR volumes  
**NEW FUNCTIONALITY:** IR volumes will be reported as 512e devices via the data in Read Capacity 16. 512e devices without Lowest Aligned Logical Block Address equal to zero won't be allowed to be added to a volume or to be used as a hot spare.

(SCGCQ00258327) Enhancement 17/22

**HEADLINE:** MPI2: Reserve Product Specific range for Event codes



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**NEW FUNCTIONALITY:** Added a product specific range to event values.

(SCGCQ00262826) Enhancement 18/22

**HEADLINE:** Trace Buffer timestamping ability for host drivers via SCSI IO

**NEW FUNCTIONALITY:** Added ability to insert Timestamp into trace buffer for a host SCSI IO via invalid device handle (0xFBAD) exception.

(SCGCQ00250563 - Port of SCGCQ00250287) Enhancement 19/22

**HEADLINE:** (HYDRA) Modify ManPage16 data to support chip down DDR in Hydra

**NEW FUNCTIONALITY:** Fixed chip down DDR implementation for DDR3  
Added DDR3 data for manpage16 compatible with the TTM chips.

(SCGCQ00251844 - Port of SCGCQ00245759) Enhancement 20/22

**HEADLINE:** SATL: Configurable Write Same execution behavior

**NEW FUNCTIONALITY:** Write Same (10/16) commands, when sent to a SATA drive that supports the SCT Write Same command, may be configured to execute either in the foreground (command does not complete until the ATA command completes) or background (command completes immediately).

The default is background execution. Set Bit 12 of the AdditionalFlags field in Manufacturing Page 11 for foreground execution. The setting applies to all SATA drives visible to the HBA and must be changed before PortEnable.

(SCGCQ00262182 - Port of SCGCQ00260431) Enhancement 21/22

**HEADLINE:** Adjust Max Continuous Operating Temp for OEM specific Mustang HBAs

**NEW FUNCTIONALITY:** Update temperature sensor max continuous operation from 75 (0x4B) to 96 (0x60) for OEM specific boards.

(SCGCQ00264840 - Port of SCGCQ00264466) Enhancement 22/22

**HEADLINE:** OEM specific: Remove KeyIndex check from Man Page 241

**NEW FUNCTIONALITY:** This update allows multiple write to OEM specific drive carrier NVRAM.