



## SCS Engineering Release Notice

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*Phase20 GCA Release Version 20.00.02.00 - SAS2FW\_Phase20 (SCGCQ00802864)*

*(SCGCQ00802864) - Phase20 GCA Release Version 20.00.02.00 - SAS2FW Phase20*  
*(SCGCQ00787192) - Phase20 Point Release Version 20.00.01.00 - SAS2FW Phase20*  
*(SCGCQ00770204) - Phase20 GCA Release Version 20.00.00.00 - SAS2FW Phase20*  
*(SCGCQ00768157) - Phase20 Beta Release Version 19.250.03.00 - SAS2FW Phase20*  
*(SCGCQ00762322) - Phase20 Beta Release Version 19.250.02.00 - SAS2FW Phase20*  
*(SCGCQ00749739) - Phase20 Alpha Release Version 19.250.01.00 - SAS2FW Phase20*  
*(SCGCQ00728149) - Phase20 Pre-Alpha Release Version 19.250.00.00 - SAS2FW Phase20*



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*Phase20 GCA Release Version 20.00.02.00 - SAS2FW\_Phase20 (SCGCQ00802864)*

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

SCGCQ00802848 (CSET) - Customers are seeing a lot of NCQ I/O error messages



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Phase20 GCA Release Version 20.00.02.00 - SAS2FW\_Phase20 (SCGCQ00802864)

## Total Defects Resolved (1)

(SCGCQ00802848 - Port of SCGCQ00795931)

Defect 1/1

**HEADLINE:** Customers are seeing a lot of NCQ I/O error messages  
**DESC OF CHANGE:** Changed default value of Additional Flags 2 in manufacturing page 11 NVDATA to 0x24 to set DataBlkRes to 9.  
**TO REPRODUCE:** Interleave non-queued commands with NCQ I/O  
**ISSUE DESC:** Customers are seeing a lot of "mpt2sas0: log\_info(0x31080000): originator(PL), code(0x08), sub\_co that decoded to be NCQ I/O failure"



**Change Summary ( Defects=1)**

SCGCQ00787001 (CSET) - IOP: When certain PCIe timeouts occur in the presence of Link Unavailable, a hang condition or data corruption can occur



# SCS Engineering Release Notice

Phase20 Point Release Version 20.00.01.00 - SAS2FW\_Phase20 (SCGCQ00787192)

## Total Defects Resolved (1)

(SCGCQ00787001 - Port of SCGCQ00755510)

Defect 1/1

<b>HEADLINE:</b>	IOP: When certain PCIe timeouts occur in the presence of Link Unavailable, a hang condition or data corruption can occur
<b>DESC OF CHANGE:</b>	Added code to configure the hardware to avoid the conditions which cause the issues.
<b>TO REPRODUCE:</b>	Cause a link unavailable situation at the same time as a PCIe Credit Timeout.
<b>ISSUE DESC:</b>	Link Unavailable is defined as Link in Recovery or Speed Change, but not Link Down. If there is a either a PCIe Credit Timeout or Shell Outbound Accept Timeout in the presence of a Link Unavailable situation the part can hang or corrupt data.



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*Phase20 GCA Release Version 20.00.00.00 - SAS2FW\_Phase20 (SCGCQ00770204)*

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



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*Phase20 Beta Release Version 19.250.03.00 - SAS2FW\_Phase20 (SCGCQ00768157)*

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

*SCGCQ00681098 (CSET) - System Hangs after Adapter reset with heavy IO load*



# SCS Engineering Release Notice

Phase20 Beta Release Version 19.250.03.00 - SAS2FW\_Phase20 (SCGCQ00768157)

## Total Defects Resolved (1)

(SCGCQ00681098 - Port of SCGCQ00646625)		Defect 1/1
<b>HEADLINE:</b>	System Hangs after Adapter reset with heavy IO load	
<b>DESC OF CHANGE:</b>	Bring all the SAS/SATA links down when we get the Adapter Reset. This should stop PCIe traffic quickly enough so that nothing is going on when the 10ms Adapter reset timer resets the chip.	
<b>TO REPRODUCE:</b>	Issue Adapter reset to controller with heavy IO load	
<b>ISSUE DESC:</b>	The adapter reset causes a reset of the card while PCIe traffic may be outstanding, resulting in a hang in one or more busses.	





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*Phase20 Beta Release Version 19.250.02.00 - SAS2FW\_Phase20 (SCGCQ00762322)*

### **Change Summary ( Defects=3 Enhancements=1)**

SCGCQ00747711 (DFCT) - Access to Last Logical Block Address (LBA) of SATA Drive is Prevented and LBA Out Of Range by One Block is Missed

SCGCQ00747288 (CSET) - Hardware Workaround to deal with Link getting stuck and causing missing drives

SCGCQ00756932 (CSET) - IR: Page Header information not filled in when RAID PHYS DISK PAGE 0 is returned for a NON-RAID Disk drive

SCGCQ00762275 (CSET) - Add support for zero length FLASH layout regions



# SCS Engineering Release Notice

Phase20 Beta Release Version 19.250.02.00 - SAS2FW\_Phase20 (SCGCQ00762322)

## Total Defects Resolved (3)

(SCGCQ00747711) Defect 1/3

**HEADLINE:** Access to Last Logical Block Address (LBA) of SATA Drive is Prevented and LBA Out Of Range by One Block is Missed

**DESC OF CHANGE:** Correct off-by-one errors in conditional statements that determine if an LBA value is out of range.

**TO REPRODUCE:** Modify the test driver to force the errors.

**ISSUE DESC:** Write Same (10) and Write Same (16) SCSI commands are not working for the last LBA of a SATA drive. In addition, if the LBA is out of range by one block, in an attempt to reassign the block, the code will fail to catch the error.

(SCGCQ00747288 - Port of SCGCQ00718818) Defect 2/3

**HEADLINE:** Hardware Workaround to deal with Link getting stuck and causing missing drives

**DESC OF CHANGE:** Added code to get HW out of the stuck condition when it's detected

**TO REPRODUCE:** No known method to reliably reproduce in the field. A UART script to force link down via register writes was able to create the hang condition

**ISSUE DESC:** A one clock timing window causes a HW lockup where a DMA engine is routed to a link but the link is idle. This prevents SMPs and data frames from being sent out, resulting in timeouts and/or the loss of one or more devices.

(SCGCQ00756932 - Port of SCGCQ00751617) Defect 3/3

**HEADLINE:** IR: Page Header information not filled in when RAID PHYS DISK PAGE 0 is returned for a NON-RAID Disk drive

**DESC OF CHANGE:** Added code for filling the header information of RAID Phys Disk Page 0 for a non-RAID disk.

**TO REPRODUCE:** Issue a read for Phys Disk Page 0 to a disk that is NOT in a RAID volume

**ISSUE DESC:** The problem is that RPDP0 is cleared, and the loadInitialData() does not fill in the header information.



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Phase20 Beta Release Version 19.250.02.00 - SAS2FW\_Phase20 (SCGCQ00762322)

## Total Enhancements Implemented (1)

(SCGCQ00762275 - Port of SCGCQ00762895)

Enhancement 1/1

**HEADLINE:** Add support for zero length FLASH layout regions

**NEW FUNCTIONALITY:** In order to provide limited support for 4MB FLASH parts on Thunderbolt, it is necessary to support zero length regions.



## SCS Engineering Release Notice

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*Phase20 Alpha Release Version 19.250.01.00 - SAS2FW\_Phase20 (SCGCQ00749739)*

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### **Change Summary ( Defects=4 Enhancements=2)**

SCGCQ00733218 (CSET) - Controller is hitting 0x265d fault while creating volume when there is an inactive volume

SCGCQ00733219 (CSET) - DID\_SOFT\_ERRORS are seen when Hot plug is performed on the RAID1 volume along with IOs.

SCGCQ00733220 (CSET) - System gets Hung & reboot while running IO's along with diag reset on the Controller which has Active and Inactive volumes.

SCGCQ00736663 (CSET) - Latency spikes seen during performance testing on OEM system

SCGCQ00685820 (ENHREQ) - MPI 2.5: distribute Target Command Buffers Received across multiple reply queues

SCGCQ00700829 (ENHREQ) - MPI 2.5: BIOS Page 1 additions



# SCS Engineering Release Notice

Phase20 Alpha Release Version 19.250.01.00 - SAS2FW\_Phase20 (SCGCQ00749739)

## Total Defects Resolved (4)

### (SCGCQ00733218 - Port of SCGCQ00731021)

Defect 1/4

**HEADLINE:** Controller is hitting 0x265d fault while creating volume when there is an inactive volume  
**DESC OF CHANGE:** Made the change to return the page if it is an internal request.  
**TO REPRODUCE:** Connect Inactive volume to the controller. Create any volume. while BGI is going on observe the Fault (0x265d).  
**ISSUE DESC:** While creating volume IR issues volume created event to the host. Host sends inquiry command to the volume. While processing inquiry command IR requests internally for raid volume page. At this time RAID volume was being used and hence returns NULL. If data accessed from this page then 265d fault is hit.

### (SCGCQ00733219 - Port of SCGCQ00715299)

Defect 2/4

**HEADLINE:** DID\_SOFT\_ERRORS are seen when Hot plug is performed on the RAID1 volume along with IOs.  
**DESC OF CHANGE:** Made change to send all OPEN\_FAILURE log codes as new IR log info code so that driver can retry the IO accordingly.  
**TO REPRODUCE:** On a RHEL setup run test IO script to unplug/plug the drive with 30 sec delay, DID\_SOFT error is seen on the system.  
**ISSUE DESC:** During drive pull push IO was terminated due to which DID\_SOFT errors are seen.

### (SCGCQ00733220 - Port of SCGCQ00714125)

Defect 3/4

**HEADLINE:** System gets Hung & reboot while running IO's along with diag reset on the Controller which has Active and Inactive volumes.  
**DESC OF CHANGE:** Made change in the code to pend the request if shared page in use so that the request can be processed when shared page not in use.  
**TO REPRODUCE:** Steps:  
1. Boot to the OS with latest firmware.  
2. Create 2 Volumes on 1 Controller, connect 1 inactive volume.  
3. Start IO's on Active Volumes Using Linux smash Utility.  
4. After IO's ran for 8 to 10 minutes, start Controller reset script. ( script will perform controller reset for every 20 Sec).  
5. System will be in Hung state after 10 to 15 minutes.  
**ISSUE DESC:** During loading the current page when there is another loading of page is occurring, IR FW was sending page with all 0's or partial data. This was leading to make driver panic the kernel intentionally and hence system was hung.

### (SCGCQ00736663 - Port of SCGCQ00711581)

Defect 4/4

**HEADLINE:** Latency spikes seen during performance testing on OEM system  
**DESC OF CHANGE:** Modified FW to reduce the ISTWI timeout which was causing the latency spikes when accessing OEM carrier devices.  
**TO REPRODUCE:** none  
**ISSUE DESC:** Periodic latency spike of ~180 ms might be observed when running IO tool (i.e. Iometer). This will occur simultaneously across all drives.



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Phase20 Alpha Release Version 19.250.01.00 - SAS2FW\_Phase20 (SCGCQ00749739)

## Total Enhancements Implemented (2)

(SCGCQ00685820)	Enhancement 1/2
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<b>HEADLINE:</b>	MPI 2.5: distribute Target Command Buffers Received across multiple reply queues
<b>NEW FUNCTIONALITY:</b>	Added MinMSIIndex and MaxMSIIndex fields to CommandBufferPostBase Request. This allows host to specify a range of MSI-x index values the IOC can use when posting a Target Command Buffer Reply Descriptor to a Reply Descriptor Post Queue.

(SCGCQ00700829)	Enhancement 2/2
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<b>HEADLINE:</b>	MPI 2.5: BIOS Page 1 additions
<b>NEW FUNCTIONALITY:</b>	For BIOS Page 1, added SSUTimeout field, and added Product Name String Format bits to the BiosOptions field.



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Phase20 Pre-Alpha Release Version 19.250.00.00 - SAS2FW\_Phase20 (SCGCQ00728149)

### **Change Summary ( Defects=6 Enhancements=3)**

SCGCQ00557354 (DFCT) - Command sas2flash -dflash results in nonfunctional system

SCGCQ00643892 (CSET) - Internal Device Reset storm after controller reset using Long CDB.

SCGCQ00677741 (CSET) - 0x6003 Fault Due to Task Management of Lost IO

SCGCQ00681099 (CSET) - 0x58A1 fault occurs on partner controller while issuing MUR to a target mode controller with outstanding IOs

SCGCQ00697505 (CSET) - IO error and stop when hot plug a HDD from RAID1

SCGCQ00726300 (CSET) - Fault 8901 is seen once the volume is roamed

SCGCQ00631031 (ENHREQ) - HW can get in a stuck state, clear that state upon break received.

SCGCQ00712525 (ENHREQ) - Set SATA HOLD threshold to be configurable in NVDATA

SCGCQ00716788 (ENHREQ) - Updated Copyright notice to Avago Technologies

**Total Defects Resolved (6)**

(SCGCQ00557354)		Defect 1/6
HEADLINE:	Command sas2flash -dflash results in nonfunctional system	
DESC OF CHANGE:	The region type passed down for a complete flash download does not match to any other existing regions. Hence we need to handle the complete firmware download request differently. The firmware download state machine was changed to account for differences between complete flash download and other download types.	
TO REPRODUCE:	Also, resolved a logical bug in the function that is used to get the region type by using a given flash offset. Execute command sas2flash -o -dflash <full flash image> <host boot image>	
ISSUE DESC:	When the command -dflash is used to download flash in sas2flash application, the system becomes unresponsive.	
(SCGCQ00643892 - Port of SCGCQ00626891)		Defect 2/6
HEADLINE:	Internal Device Reset storm after controller reset using Long CDB.	
DESC OF CHANGE:	New code was added to check for the special tx dma type when long cdb is used. Firmware is now able to clean up this type of entry from the transport layer.	
TO REPRODUCE:	Controller->Expander->Controller target mode	
ISSUE DESC:	While controller is sending long CDB mpi scsi io requests to a target device, reset the expander. Long CDB makes use of special dma type. There's no code in gen2 or gen3 firmware to clean out this type of dma entry during hw clean up. Therefore this type of entry would get stuck in the transport layer and keep requesting port layer to open a connection. Eventually our open reject timer would expire and send out target reset, but we still couldn't clean out those entries. The same thing will keep repeating itself.	
(SCGCQ00677741 - Port of SCGCQ00658882)		Defect 3/6
HEADLINE:	0x6003 Fault Due to Task Management of Lost IO	
DESC OF CHANGE:	Modified the FW to access the DmaGroup portion of the 32 bit word as a byte access to prevent the compiler from doing a read/modify/write and overwriting what HW had just changed.	
TO REPRODUCE:	Issue a Sas IO Unit Control command to set the DmaGroup for a device right in the middle of a sequence of Inquiry commands. It will probably take many attempts to hit the right timing window.	
ISSUE DESC:	An IO gets a timeout and is aborted by the host. The IO is not found in any queues or HW blocks, resulting in the fault. The IO is lost due to corruption of an internal queue as the result of FW updating a 32 bit memory location at the same time as the HW.	
(SCGCQ00681099 - Port of SCGCQ00680151)		Defect 4/6
HEADLINE:	0x58A1 fault occurs on partner controller while issuing MUR to a target mode controller with outstanding IOs	
DESC OF CHANGE:	To reply to commands on the command received queue, the code has been changed to look at the full 64 bit address for the command buffers.	
TO REPRODUCE:	Issue MUR to a target mode controller while there are IOs still in the command received queue.	
ISSUE DESC:	MUR cleanup of the command buffers assumes the command buffer base address is in low memory (Upper 32 bits of the address are all 0).	
(SCGCQ00697505 - Port of SCGCQ00692866)		Defect 5/6
HEADLINE:	IO error and stop when hot plug a HDD from RAID1	
DESC OF CHANGE:	A new log code is added to address the issue.	
TO REPRODUCE:	On a RHEL setup run test IO script to unplug/plug the drive with 30 delay, IO error is seen on the system.	
ISSUE DESC:	IO was completing with an error during pull/push of a drive on a RAID 1 volume.	
(SCGCQ00726300 - Port of SCGCQ00688470)		Defect 6/6
HEADLINE:	Fault 8901 is seen once the volume is roamed	
DESC OF CHANGE:	Changed the IOC page 6 constructor handling to call the fixed page constructor so that IOC page 6 cannot be shared with the other pages like RAID volume page and RAID Physdisk page.	





## SCS Engineering Release Notice

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*Phase20 Pre-Alpha Release Version 19.250.00.00 - SAS2FW\_Phase20 (SCGCQ00728149)*

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**TO REPRODUCE:**

1. Create Raid10 volume with 6 SAS Drives. Wait till the BGI completes.
2. Run IOs on the volume for 15 mins to 20 mins
3. Pull non-Adjustment drives
4. Volume will be in Degraded State. Now do a unclean Shutdown.
5. Roam the volume to the other system.

Expected result: The Fault 8901 should not be seen.

Observed result: 8901 Fault is seen.

**ISSUE DESC:**

When a volume is roamed to other SAS2 card , 0x8901(Shared page buffer is already in use) fault was occurring. When a volume was roamed Host would request many page like IOC page6, RAID volume page, RAID Physdisk page etc., IOC page 6 page request was leading to fault since this page was being shared with the RAID volume and RAID physdisk page.

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# SCS Engineering Release Notice

Phase20 Pre-Alpha Release Version 19.250.00.00 - SAS2FW\_Phase20 (SCGCQ00728149)

## Total Enhancements Implemented (3)

(SCGCQ00631031)	Enhancement 1/3
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**HEADLINE:** HW can get in a stuck state, clear that state upon break received.

**NEW FUNCTIONALITY:** Upon Break Received Interrupt, check for HW being in a stuck state and clear that stuck state

(SCGCQ00712525)	Enhancement 2/3
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**HEADLINE:** Set SATA HOLD threshold to be configurable in NVDATA

**NEW FUNCTIONALITY:** Set SATA HOLD threshold to be configurable in NVDATA. This field can be set in NVDATA manufacturing page 11 AddlFlags2 bit 2-5. Default value is 0x9, same as previous version. Threshold = (Setting + 1) \* 4, so 0x9 = 40, 0xF = 64

(SCGCQ00716788)	Enhancement 3/3
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**HEADLINE:** Updated Copyright notice to Avago Technologies

**NEW FUNCTIONALITY:** No functional changes made