



SCS Engineering Release Notice

Phase16 GCA Release Version 16.00.00.00 - SAS2FW_Phase16 (SCGCQ00397590)

(SCGCQ00397590) - Phase16 GCA Release Version 16.00.00.00 - SAS2FW Phase16
(SCGCQ00395523) - Phase16 Beta Release Version 15.250.05.00 - SAS2FW Phase16
(SCGCQ00392392) - Phase16 Beta Release Version 15.250.04.00 - SAS2FW Phase16
(SCGCQ00390617) - Phase16 Beta Release Version 15.250.03.00 - SAS2FW Phase16
(SCGCQ00384555) - Phase16 Beta Release Version 15.250.02.00 - SAS2FW Phase16
(SCGCQ00372062) - Phase16 Alpha Release Version 15.250.01.00 - SAS2FW Phase16
(SCGCQ00367952) - Phase16 Alpha Release Version 15.250.00.00 - SAS2FW Phase16



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Phase16 GCA Release Version 16.00.00.00 - SAS2FW_Phase16 (SCGCQ00397590)

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



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Phase16 Beta Release Version 15.250.05.00 - SAS2FW_Phase16 (SCGCQ00395523)

Change Summary (Defects=4)

SCGCQ00384337 (DFCT) - Locate command when initiated for a volume member, stops automatically after 3-4 minutes

SCGCQ00393454 (DFCT) - SATL: Unmap limits artificially limited to prevent OS timeouts

SCGCQ00392262 (DFCT) - Fault 8204 observed when existing second volume is pulled back to the configuration

SCGCQ00395877 (DFCT) - Fault 8704 is hit consistently while pulling & pushing volume drive with Diag Reset

Total Defects Resolved (4)

(SCGCQ00384337)		Defect 1/4
HEADLINE:	Locate command when initiated for a volume member, stops automatically after 3-4 minutes	
DESC OF CHANGE:	Added a check to turn off the LED's, only if the drive had SMART error.	
TO REPRODUCE:	Create a raid1 volume with two SAS drives.Using SAS2IRCU intiate Locate command for a volume member.	
ISSUE DESC:	When a Locate command is sent to a drive, Locate LED's of that drive should keep blinking till user issues to turn off the Locate LED's but as we poll for SMART errors for every 5 minutes, we turn off the Locate LED's if there are no SMART errors.	
(SCGCQ00393454)		Defect 2/4
HEADLINE:	SATL: Unmap limits artifically limited to prevent OS timeouts	
DESC OF CHANGE:	Changed the BLOCK LIMITS VPD page to artificially limit the MAXIMUM UNMAP LBA COUNT and MAXIMUM UNMAP BLOCK DESCRIPTOR COUNT to prevent broken applications from causing timeouts. The new MAXIMUM UNMAP LBA COUNT is 0x3FFF and MAXIMUM UNMAP BLOCK DESCRIPTOR COUNT is now 0x20.	
TO REPRODUCE:	Using an application which doesn't self-limit the size of unmap descriptor lists, try to unmap a very large region. If the application has this defect, it should generate such a large unmap command that it times out before the SATA device completes the TRIMs for the regions specified.	
ISSUE DESC:	Some OSES or applications attempt to create extremely large UNMAP. commands when the MAXIMUM UNMAP LBA COUNT and MAXIMUM UNMAP BLOCK DESCRIPTOR COUNT fields on the block limits VPD page are large. These values are accurate since the SATL can accept very large UNMAP commands, but need to be limited to prevent applications from causing timeouts by issuing very large unmmaps.	
(SCGCQ00392262)		Defect 3/4
HEADLINE:	Fault 8204 observed when existing second volume is pulled back to the configuration	
DESC OF CHANGE:	There were no changes made to firmware for this issue.	
TO REPRODUCE:	Create a RAID1 volume comprised of SAS drives and a RAID1 volume comprised of SATA drives. Wait for BGI to complete on both volumes. Pull out the physical drives comprising volume V1 and volume V2. Issue a diagnostic reset. Push in the physical drives comprising volume V1. Issue another diagnostic reset. Push in the physical drives comprising volume V2. Now execute a SAS2IRCU status command.	
ISSUE DESC:	When physical drives that are members of IR volumes are being pulled and pushed the configuration is being updated as a result of discovery events. If an external utility issues requests to IR for RAID configuration pages prior to the configuration update completing IR FW will fault with fault code 8204. In order to avoid this issue the workaround is to avoid issuing RAID configuration page requests from utilities until as least 10 seconds following a replug of IR volume physical drives. This will allow enough time for the IR configuration to complete updating before receiving the configuration page request.	
(SCGCQ00395877)		Defect 4/4
HEADLINE:	Fault 8704 is hit consistently while pulling & pushing volume drive with Diag Reset	
DESC OF CHANGE:	There is no change in firmware but a work around when the 8704 fault occurs. Once the 8704 fault is hit consistently, the hot spare drive inserted last should be removed and the server rebooted. Once the server comes back up, the removed drive can be inserted back in and it now becomes the hot spare because it is inserted into the hot slot and new metadata is written to it. The existing volumes will finish rebuilding (if necessary) and become optimal. Since controller resets are rare, the probability of a reset occurring when the drive is plugged in initially is very low, and the likelihood of a controller reset when the drive is plugged in again is even lower.	
TO REPRODUCE:	1. Create a RAID 1 volume (2 drives) and RAID 10 volume (4 drives). Assign 2 global hot spares. 2. Pull the secondary from the Raid1 volume and one secondary from the Raid1E volume (simultaneously) 3. Wait 10 counted seconds 4. Push the drives pulled in step 2 (simultaneously) 5. Wait 10 counted seconds 6. Diag reset 7. Wait 10 counted seconds 8. Pull the new secondaries from both volumes (simultaneously) 9. Wait 10 counted seconds 10. Push the drives pulled in step 8 (simultaneously) 11. Wait 10 counted seconds 12. Diag reset 13. Wait 10 counted seconds	



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ISSUE DESC:

14. Repeat from step 1 until the 8704 fault is hit.

A Metadata Update was in progress on the recently added disk drive, and a controller reset occurred before the metadata update completed. After the reset the metadata on the drive will have been partially updated. This partial update results in the Fault 8704 as the metadata is being processed.



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Phase16 Beta Release Version 15.250.04.00 - SAS2FW_Phase16 (SCGCQ00392392)

Change Summary (Defects=1)

SCGCQ00391553 (DFCT) - In Windows, first volume disappears in Device Manager after second volume is created.



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Phase16 Beta Release Version 15.250.04.00 - SAS2FW_Phase16 (SCGCQ00392392)

Total Defects Resolved (1)

(SCGCQ00391553)		Defect 1/1
HEADLINE:	In Windows, first volume disappears in Device Manager after second volume is created.	
DESC OF CHANGE:	Backed out changes made in SCGCQ00377005	
TO REPRODUCE:	<ol style="list-style-type: none">1. Flash the controller with Beta Build(15.250.03.00).2. Create one RAID1 volume with SAS Drives.3. Wait for BGI to complete.4. Create another RAID1 volume with SATA Drives.	
ISSUE DESC:	This behavior is seen due to code changes of the defect SCGCQ00377005 (Fault 8204 observed when existing second volume is pulled back to the configuration). Driver is sending a config request as the configuration is not finalized i am completing the config request with iocstatus = MPI2_IOCSTATUS_BUSY. And the driver is not retrying if a config request is completed.	



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Phase16 Beta Release Version 15.250.03.00 - SAS2FW_Phase16 (SCGCQ00390617)

Change Summary (Defects=4)

SCGCQ00376648 (DFCT) - Fault 860B(IFAULT_IR_NEW_WJ_ENTRY_ERROR) while pulling & pushing volume drive with IOs & Diag Reset

SCGCQ00377005 (DFCT) - Fault 8204 observed when existing second volume is pulled back to the configuration

SCGCQ00380840 (DFCT) - Fault 0x8618 is seen when a new volume is created in the presence of another volume which is undergoing resync along with IO

SCGCQ00386639 (DFCT) - PL: Possible performance drop in small topologies.

Total Defects Resolved (4)

(SCGCQ00376648)		Defect 1/4
HEADLINE:	Fault 860B(IFAULT_IR_NEW_WJ_ENTRY_ERROR) while pulling & pushing volume drive with IOs & Diag Reset	
DESC OF CHANGE:	Made changes to clear the write journal entry even after a virtual IO is failed.	
TO REPRODUCE:	Create 1 raid1 volumes with SAS Drives with 1 HS say V1. Create 1 raid10 volumes with SATA Drives with 1 HS say V2. Wait for BGI to complete on both the volumes. Start IOs on both the volumes. Start a script which will issue Diag Reset to HBA in every 60 Sec. Pullout Secondary drive of volume V1 & after 10 Sec push it back.Now Pullout drive from volume V2 & after 10 Sec push it back. Repeat previous two steps(pulling and pushing of secondary drives on the volumes) for 4-5 times.	
ISSUE DESC:	When a virtual IO was failed , IR FW was not clearing write journal entry. Different write journal entries were available for same virtual LBA. When creating write journal entry for the existing entry's LBA , 860B fault was occurring.	
(SCGCQ00377005)		Defect 2/4
HEADLINE:	Fault 8204 observed when existing second volume is pulled back to the configuration	
DESC OF CHANGE:	Added a check to fail configuration request if the configuration wasn't finalized.	
TO REPRODUCE:	Create raid1 volumes with SAS Drives and SATA Drives. Wait for BGI to complete on both, Pullout Volume V1 & Volume V2. Issue Reset, and push Volume V1, again issue Diag reset and Push Volume V2. Now execute SAS2IRCU status cmd.	
ISSUE DESC:	During push and pull of the phydisks, the configurations are still updating. And when a status command is issued before finalizing the configuration we hit 8204 fault.	
(SCGCQ00380840)		Defect 3/4
HEADLINE:	Fault 0x8618 is seen when a new volume is created in the presence of another volume which is undergoing resync along with IO	
DESC OF CHANGE:	When IOs are run on a resyncing volume that employs fast resync, FRJ entries are created. However, when a volume is created, the volume constructor was clearing the fast resync journal entries even if they belonged to a different volume. Later, when the FRJ task ran, the volume information was not available because the fast resync journal was cleared. This led to the fault.	
TO REPRODUCE:	Added a check to see if the FRJ entries belong to the same volume that is being created before clearing fast resync journal. 1.Create RAID1 volume(V1) of size 1GB along with one HS 2.Allow volume to become optimal and start IOs on the volume using linuxsmash 3.Pull primary HDD from the volume; resync starts with the hotspare. 4.Allow the resync to get completed 5.Insert back the drive pulled in step3. It becomes a hotspare. 6.Pull new primary HDD from the volume, Resync starts with the hotspare. 7.Create RAID1 volume(V2) of MAX size.	
ISSUE DESC:	Result: Fault 8618 is hit and controller resets successfully. Create RAID1 volume using SAS HDD along with one hot spare. After the volume becomes optimal start IOs on the volume. First, pull the primary HDD, allow the volume to complete resync. Insert back the pulled HDD, which becomes a hot spare. Pull the new primary HDD and after the resync starts create another RAID1 volume of MAX size using SAS HDD. FAULT 8618 is seen when RAID1 volume is created and resync is in progress for another volume.	
(SCGCQ00386639)		Defect 4/4
HEADLINE:	PL: Possible performance drop in small topologies.	
DESC OF CHANGE:	During discovery the port width of the device is updated; however, an internal cache is not updated. This change clears the cache entry when the appropriate field has been updated.	
TO REPRODUCE:	Create a topology with a small number of devices on wide ports. Begin running IO to those devices.	
ISSUE DESC:	Some configurations may experience a performance drop while running IO. Phys that lose their initial connections may not be opened again.	



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Phase16 Beta Release Version 15.250.02.00 - SAS2FW_Phase16 (SCGCQ00384555)

Change Summary (Defects=11)

SCGCQ00371992 (DFCT) - (IOP) Add option to disable PCIE 3.0 back channel

SCGCQ00372118 (DFCT) - IOP: Duplicate Fault Code

SCGCQ00375812 (DFCT) - SAS2FW: Failed PI RAID0 volume status is not updated properly

SCGCQ00376366 (DFCT) - SAS2FW: NVDATA version not changed from phase15 to phase16

SCGCQ00379093 (DFCT) - SAS2 IR - ADDITIONAL LENGTH Not Being Correctly Set for RAID1 Volume's

Standard Inquiry Response

SCGCQ00379096 (DFCT) - PERIPHERAL DEVICE TYPE Not Being Correctly Set for Unit Serial Number

VPD page

SCGCQ00380266 (DFCT) - Allocation Length for SCSI REQUEST SENSE Command is not Handled

Properly for RAID Volume

SCGCQ00380267 (DFCT) - Allocation Length for SCSI READ CAPACITY (16) Command is not Handled

Properly for RAID Volume

SCGCQ00332183 (CSET) - Foreign volume activation fails in the presence of failed native volume

SCGCQ00356943 (CSET) - DDR initialization fails with Fault code 0x905A

(DDRINIT_FAULT_MC_ECC_FAILURE1)

SCGCQ00378367 (CSET) - Command Timeouts to SATA HDD Behind Expander

Total Defects Resolved (11)

(SCGCQ00371992)		Defect 1/11
HEADLINE:	(IOP) Add option to disable PCIE 3.0 back channel	
DESC OF CHANGE:	Added an option for customers to use the work-around which disables automated back-channel negotiations in favor of hardware presets. The user sets a NVDATA Boot Flag and modifies the SBR PCIe3 settings	
TO REPRODUCE:	Place a Thunderbolt D.1 card in a PCIe3 system with a long channel length	
ISSUE DESC:	The received eye margins are a function of the equalization determined by the settings for transmit de-emphasis, analog equalization in the analog front-end (AFE) and DFE. The backchannel algorithm to determine the optimal values of these multiple variables is sensitive to the AFE transfer function. The joint adaptation can sometimes lead to sub-optimal values due to the interaction between the AFE response and the backchannel algorithm which can lead to receiver errors in links where the margins are limited.	
(SCGCQ00372118)		Defect 2/11
HEADLINE:	IOP: Duplicate Fault Code	
DESC OF CHANGE:	Changed the fault code number to be unique.	
TO REPRODUCE:	None. This problem was found during code inspection.	
ISSUE DESC:	An incorrect fault code is being used.	
(SCGCQ00375812)		Defect 3/11
HEADLINE:	SAS2FW: Failed PI RAID0 volume status is not updated properly	
DESC OF CHANGE:	Made changes to pend the BGI when a drive is pulled during BGI for PI drives.	
TO REPRODUCE:	Create RAID0 volume using 2 PI SAS drives. While BGI is in progress remove anyone of the volume drive. Expected: 1. Volume state should updated to failed state. 2. BGI should go to pending state.	
ISSUE DESC:	Observed: 1. Volume state updated to failed state. 2. BGI still in progress state .	
	Create RAID0 volume using 2 PI SAS drives. While BGI is in progress remove anyone of the volume drive. After removing the drive, volume state updated to failed state, however current operation still shown as BGI is in progress. But during BGI if a drive is pulled , BGI should be pended.	
(SCGCQ00376366)		Defect 4/11
HEADLINE:	SAS2FW: NVDATA version not changed from phase15 to phase16	
DESC OF CHANGE:	Updated NVDATA version to phase 16 (0x1000).	
TO REPRODUCE:	Flash 15.250.01.00 (phase 16) firmware to board that has phase 15 GCA firmware. New NVDATA change does not take affect.	
ISSUE DESC:	The Nvdata Major version is not changed from Ph15 to Ph16. There was NVDATA change in phase 16. If we upgrade fw from Ph15 GCA to Ph16 Alpha these changes will not be taken into effect since there is no change in the NVDATA version.	
(SCGCQ00379093)		Defect 5/11
HEADLINE:	SAS2 IR - ADDITIONAL LENGTH Not Being Correctly Set for RAID1 Volume's Standard Inquiry Response	
DESC OF CHANGE:	Made changes to the ADDITIONAL LENGTH field of standard inquiry data to account for remaining bytes of the standard inquiry data.	
TO REPRODUCE:	Create a RAID1 Volume using two SAS Drive. Execute a standard Inquiry Command to the RAID Volume. Check ADDITIONAL LENGTH field in the response of standard Inquiry data.	
ISSUE DESC:	Issue a standard Inquiry SCSI command to the volume. The command execution passes but the ADDITIONAL LENGTH filed is incorrect. Utility gets 56 bytes of standards inquiry data where ADDITIONAL LENGTH should be set as 0x33 but ADDITIONAL LENGTH is populated as 0x34.	



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Phase16 Beta Release Version 15.250.02.00 - SAS2FW_Phase16 (SCGCQ00384555)

(SCGCQ00379096) Defect 6/11

HEADLINE: PERIPHERAL DEVICE TYPE Not Being Correctly Set for Unit Serial Number VPD page
DESC OF CHANGE: The PERIPHERAL DEVICE TYPE and PERIPHERAL DEVICE QUALIFIER were initialized to zero.
TO REPRODUCE: Create a RAID1 Volume using two SAS Drive and execute a VPD (Page 0x80) Inquiry SCSI command to the RAID 1 Volume.
ISSUE DESC: The PERIPHERAL DEVICE TYPE and PERIPHERAL DEVICE QUALIFIER were not initialized to zero in Vital Product Data pages.

(SCGCQ00380266) Defect 7/11

HEADLINE: Allocation Length for SCSI REQUEST SENSE Command is not Handled Properly for RAID Volume
DESC OF CHANGE: Added code in handling of request sense for an IR volume to take care of the allocation length field appropriately.
TO REPRODUCE: 1) Create a RAID1 Volume using two SAS Drive.
2) Execute a Request Sense Command to the RAID Volume with allocation length=0x00 (sg_raw -r 512 /dev/sg0 03 00 00 00 00 00)
Expected : No data should be sent back
Actual: 20 bytes were sent back
ISSUE DESC: IR did not have code to handle the allocation length field.

(SCGCQ00380267) Defect 8/11

HEADLINE: Allocation Length for SCSI READ CAPACITY (16) Command is not Handled Properly for RAID Volume
DESC OF CHANGE: Added code in handling of Read Capacity(16) for an IR volume to take care of the allocation length field appropriately.
TO REPRODUCE: 1) Create a RAID1 Volume using two SAS Drive.
2) Execute a Read Capacity(16) Command to the RAID Volume with allocation length=0x00 (sg_raw -r 512 /dev/sg0 9e 10 00 00 00 00 00 00 00 00 00 00 00 00 -v)
Expected : No data should be transferred.
Actual: 32 bytes were transferred.
ISSUE DESC: IR did not have code to handle the allocation length field for Read Capacity(16) command.

(SCGCQ00332183 - Port of SCGCQ00319367) Defect 9/11

HEADLINE: Foreign volume activation fails in the presence of failed native volume
DESC OF CHANGE: While checking for a failed volume, the device handle should be used to get the RAID Volume Page 0. Instead the volume number was used. Made changes to use the device handle of the volume.
TO REPRODUCE: Create RAID1 (V1) volume in C1(Fury B0) using SAS3IRCU, wait till BGI completes.
Create RAID1 (V2) volume in C2(Fury B0) using SAS3IRCU, wait till BGI completes.
Remove the volume drives from the C1.
Expected: Volume will be failed state now.
Roam the V2 to C1.
Expected: 2 two volumes (inactive volume, failed volume).
Activate the inactive.
Expected: Volume should be activated successfully.
Observed: Volume activation fails.
ISSUE DESC: Create RAID1 (V1) volume in C1(Fury B0) using SAS3IRCU, wait till BGI completes.
Create RAID1 (V2) volume in C2(Fury B0) using SAS3IRCU, wait till BGI completes.
Remove the volume drives from the C1.
Expected: Volume will be failed state now.
Roam the V2 to C1.
Expected: 2 two volumes (inactive volume, failed volume).
Activate the inactive.
Expected: Volume should be activated successfully.
Observed: Volume activation fails.



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Phase16 Beta Release Version 15.250.02.00 - SAS2FW_Phase16 (SCGCQ00384555)

(SCGCQ00356943 - Port of SCGCQ00325337)

Defect 10/11

HEADLINE: DDR initialization fails with Fault code 0x905A (DDRINIT_FAULT_MC_ECC_FAILURE1)
DESC OF CHANGE: The memory controller interrupt handler function is called with scrubbing functionality flag disabled.
TO REPRODUCE:
- Flash SDK images - u-boot .bin and ubootlib.bin- to D1 board
- Reset the board.
ISSUE DESC: The ECC scrubbing functionality is not yet implemented in DDR3 library . The memory controller interrupt handler has a flag for doing the scrubbing if this functionality is in place. But during write levelling adjustment step in DDR3 training the interrupt handler is called with this flag set to true . Since the functionality is not yet implemented , it resulted in 0x905A fault.

(SCGCQ00378367 - Port of SCGCQ00364486)

Defect 11/11

HEADLINE: Command Timeouts to SATA HDD Behind Expander
DESC OF CHANGE: Enable hardware workaround to recover pll from stuck on open connection.
Set Pathway Blocked Count to some non zero value for SATA devices in the device table.
TO REPRODUCE: Need a SATA drive behind a non-LSI expander to reproduce this issue. Running some IOs to the drive behind the expander hangs the system.
ISSUE DESC: When 3rd party Expander SAS address is higher to LSI HBA in HBA->Exp->SATA topology, write commands to SATA HDDs time out.



SCS Engineering Release Notice

Phase16 Alpha Release Version 15.250.01.00 - SAS2FW_Phase16 (SCGCQ00372062)

Change Summary (Defects=4)

SCGCQ00264319 (DFCT) - Gen2:IR:During IOs on removing one of the volume member the IOs are terminating with write error

SCGCQ00328534 (DFCT) - Fault 265D(IFAULT_FATAL_INT_DATA_TLB_ERROR) while deleting the volume

SCGCQ00363007 (DFCT) - PL: "pl snf" not included in "pl dbg" output

SCGCQ00367931 (DFCT) - In fault state, loc2Sys Doorbell IRQ is cleared before host polls the register to see the fault

Total Defects Resolved (4)

(SCGCQ00264319)		Defect 1/4
HEADLINE:	Gen2:IR:During IOs on removing one of the volume member the IOs are terminating with write error	
DESC OF CHANGE:	Made changes to make sure that the drive alive doesnt send TURs when the DMD timer for a drive is active.	
TO REPRODUCE:	<ol style="list-style-type: none">1. Create a IM volume2. After BGI, initiate IOs on the volume3. During IOs remove one of the volume member	
	Expected Result: The IOs must continue on the other volume member	
	Actual Result: The los are terminating with write error. This will not happen on every try. The timing has to be right.	
ISSUE DESC:	If a drive was pulled out while running host IOs, there is a possiblity of Host IOs erroring out on a redundant volume. The fundamental problem is that if there is an internal IO, the Event Task does not process any queued events until the internal IO is completed. If an Internal IO like TUR (issued by drive alive) is sent after the DMD for the drive has started, but the drive removal has not yet been processed, the IO can time out. So there can be a maximum of about 9 seconds where the Event will be held by the IR firmware (2 seconds for DMD, and 7 seconds for internal IO to timeout, if the TUR is just just before the DMD expires). This can cause the Host IOs to time out as well and error out.	
(SCGCQ00328534)		Defect 2/4
HEADLINE:	Fault 265D(IFAULT_FATAL_INT_DATA_TLB_ERROR) while deleting the volume	
DESC OF CHANGE:	Made changes not to delete the native configuration if it is found foreign due to out of sync of golden sequence number.Instead clear all the elements of configuration. This would be equivalent to deletion of configuration as in case of foreign configuration. Then change the configuration to native, so that further operations are possible.	
TO REPRODUCE:	Create 2 raid1 volumes V1 and V2. Wait for BGI to complete on both. Pull volume V1 & then volume V2. Do a port Reset. Push the volume V1 back. After 10 seconds, pull out the cable connected to enclosure. Delete the Inactive, Missing volumes. 265D fault is hit.	
ISSUE DESC:	A native configuration has become foreign configuration due to out of sync of golden sequence number. Native configuration doesn't reside in the heap memory. While deleting the volume, configurations are also deleted if it is empty and foreign. Since memory is not allocated for native configuration , deletion causes 265D fault.	
(SCGCQ00363007)		Defect 3/4
HEADLINE:	PL: "pl snf" not included in "pl dbg" output	
DESC OF CHANGE:	Changed the "pl dbg" command to call the "pl snf" routine.	
TO REPRODUCE:	Issue the command "pl dbg" to the controller.	
ISSUE DESC:	The output from the command "pl dbg" does not include the command "pl snf"	
(SCGCQ00367931)		Defect 4/4
HEADLINE:	In fault state, loc2Sys Doorbell IRQ is cleared before host polls the register to see the fault	
DESC OF CHANGE:	Removed clearing loc2Sys IRQ statement. Let the host polls and clear that IRQ.	
TO REPRODUCE:	With a host polling on loc2Sys doorbell IRQ, trigger a fault to the card such as 0xC0FFEE fault, the host does not see the fault.	
ISSUE DESC:	In the case that host polls the loc2Sys IRQ to determine if fault occurs, loc2Sys IRQ is cleared before host polls the register in fault state.	



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Phase16 Alpha Release Version 15.250.00.00 - SAS2FW_Phase16 (SCGCQ00367952)

Change Summary (Defects=6 Enhancements=13 NVDATA=1)

SCGCQ00202921 (DFCT) - The PCIe during link up and link down events can generate false alignment FIFO overrun and underrun errors on SAS2208 and SAS2308

SCGCQ00296740 (DFCT) - BGI happens on the volume, when the volume creation is failed in SAS2IRCU

SCGCQ00345883 (DFCT) - Additional Sense Length field was not being populated properly when converting from descriptor format to fixed format sense data format.

SCGCQ00352212 (DFCT) - A RAID0 volume with PI drives the BGI does not gets initiated after removing and reinserting a volume member

SCGCQ00344896 (CSET) - Target Status Send request fails on retry

SCGCQ00363101 (CSET) - Fault on PhlynkTable DevTblErrStat interrupt

SCGCQ00245480 (ENHREQ) - PL: Zero out some internal structures

SCGCQ00315721 (ENHREQ) - Initialize IO Unit Page 7 "IOCTemperature" and "IOCTemperatureUnits" before FW Operational State

SCGCQ00328798 (ENHREQ) - Gen2 IR :Explore adding additional logging or protection w.r.t nvram access.

SCGCQ00332818 (ENHREQ) - Modify how memory controller errors are handled

SCGCQ00337167 (ENHREQ) - MPI2: Add TargetModeAbort by initiator device handle

SCGCQ00339375 (ENHREQ) - Turn on Allow Table-to-Table Links bit in SAS IO Unit Page 1 in default NVDATA.

SCGCQ00343541 (ENHREQ) - Disable SGPIO Group ID support in Channel NVDATA XML's

SCGCQ00345215 (ENHREQ) - MPI2: Add new TargetModeAbort AbortType to only abort Command IUs

SCGCQ00356796 (ENHREQ) - MPI2: Use Slot Information during Port Enable Event Replay option

SCGCQ00357228 (ENHREQ) - MPI2: Add OEM Identifier to BIOS Page 1

SCGCQ00316300 (CSET) - Add visibility into DDR training information

SCGCQ00319944 (CSET) - Security freeze SATA devices at init time

SCGCQ00348335 (CSET) - Target mode abort all IOs except Task IUs

SCGCQ00346294 (NVDATA) - Initial check-in for SAS9208-8i and 9218-8i NVDATA



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Phase16 Alpha Release Version 15.250.00.00 - SAS2FW_Phase16 (SCGCQ00367952)

Total Defects Resolved (6)

(SCGCQ00202921) Defect 1/6

HEADLINE: The PCIe during link up and link down events can generate false alignment FIFO overrun and underrun errors on SAS2208 and SAS2308

DESC OF CHANGE: At SOD firmware will check and clear all alignment FIFO errors.

TO REPRODUCE: These errors can occur during training on certain PCIe exerciser setups.

ISSUE DESC: On SAS2208 and SAS2308, The PCIe during link up and link down event can generate false alignment FIFO overrun and underrun errors.

(SCGCQ00296740) Defect 2/6

HEADLINE: BGI happens on the volume, when the volume creation is failed in SAS2IRCU

DESC OF CHANGE: When medium errors are injected, OS tries to read LBA 0. During this time if volume creation request is made then it was timing out. And utility was showing up as volume creation failed.

Made changes to hide the drives at the start of volume creation instead of hiding at the end of volume creation. This would allow to complete Internal IOs quickly. Whenever volume creation is failed drives will be unhidden.

TO REPRODUCE: Inject medium error to two bare SATA Drives. Create RAID1 volume with those 2 SATA Drives. Volume creation failed message is shown in the utility. Check the volume status. It shows as optimal.

ISSUE DESC: Volume creation was timing out soon after injecting medium errors to the drives. And utility was showing "Volume creation failed".

(SCGCQ00345883) Defect 3/6

HEADLINE: Additional Sense Length field was not being populated properly when converting from descriptor format to fixed format sense data format.

DESC OF CHANGE: Populated Additional Sense Length field properly when converting from descriptor format sense data to fixed format sense data.

TO REPRODUCE: Send an OpCode that will result in a check condition to a device that returns descriptor format sense data. The discovering case was to send CDB 85062c00da00000000004f00c200b000 to an ATA device that is part of a RAID1 volume (i.e. Raid Pass-Through).

ISSUE DESC: Additional Sense Length field was not being populated properly when converting from descriptor format to fixed format sense data format.

(SCGCQ00352212) Defect 4/6

HEADLINE: A RAID0 volume with PI drives the BGI does not get initiated after removing and reinserting a volume member

DESC OF CHANGE: Made changes to schedule pended background initialization, when a removed phydisk is reinserted for Raid0 volume.

TO REPRODUCE: Create a RAID 0 volume with PI drives, issue status command and check whether background initialization is initiated. While background initialization in progress remove one of the volume member and reinsert. Issue status command to check whether background initialization has started or not.

ISSUE DESC: Create a Raid0 volume, while background initialization is in progress remove one of the drive and reinsert, after which background initialization is not scheduled.

(SCGCQ00344896 - Port of SCGCQ00338581) Defect 5/6

HEADLINE: Target Status Send request fails on retry

DESC OF CHANGE: Clear the target status send response bit for a failed request that will prevent the FW from clearing the context of the request.

TO REPRODUCE: In a target mode setup, send a SCSI write command to target and when target driver send TSS request to target FW, jam the TSS request open address frame. TSS request will fail with IOCStatus = NO_CONNECTION_RETRYABLE and IOCLogInfo = 0x3112010C(Open Timeout). Retry the TSS request and it will fail with IOCStatus = NO_CONNECTION and IOCLogInfo = 0x31180008(Target Status Send Termination)

ISSUE DESC: When Target Status Send (TSS) is sent from the target host driver to SAS2008 target FW, it returns an error reply to this request with IOCStatus = NO_CONNECTION_RETRYABLE and IOCLogInfo = 0x3112010C(Open Timeout) when request gets jammed. Then the target host driver retries to send TSS. Retried TSS fails with an error reply with IOCStatus = NO_CONNECTION and IOCLogInfo =



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0x31180008(Target Status Send Termination).

(SCGCQ00363101 - Port of SCGCQ00361839)

Defect 6/6

HEADLINE:	Fault on PhlynkTable DevTblErrStat interrupt
DESC OF CHANGE:	Added code to fault on a PhlynkTable DevTblErrStat interrupt.
TO REPRODUCE:	N/A
ISSUE DESC:	The PhlynkTable DevTblErrStat interrupt was enabled, but we were just clearing the interrupt when we should be faulting.



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Total Enhancements Implemented (13)

(SCGCQ00245480) Enhancement 1/13

HEADLINE: PL: Zero out some internal structures
NEW FUNCTIONALITY: Some internal structures could get into an inconsistent state if devices are moved from one phy to another. Zeroing these structures out when the device is removed will avoid that possibility.

(SCGCQ00315721) Enhancement 2/13

HEADLINE: Initialize IO Unit Page 7 "IOCTemperature" and "IOCTemperatureUnits" before FW Operational State
NEW FUNCTIONALITY: IOCTemperature and IOCTemperature unit in IOUnit page 7 will be updated before firmware operational state.

(SCGCQ00328798) Enhancement 3/13

HEADLINE: Gen2 IR :Explore adding additional logging or protection w.r.t nvram access.
NEW FUNCTIONALITY: Added logs to record GUID mismatch and GSN mismatch for a volume. These will help us detect errors in NVSRAM that could be caused due to various possible reasons like, for example a bug in the NVSRAM hardware design.

(SCGCQ00332818) Enhancement 4/13

HEADLINE: Modify how memory controller errors are handled
NEW FUNCTIONALITY: Memory controller (DDR2/DDR3) errors now fault with a unique set of fault codes to indicate more information regarding the error that occurred. In addition, error information regarding ECC errors is output to the serial port providing additional error information on ECC specific errors.

(SCGCQ00337167) Enhancement 5/13

HEADLINE: MPI2: Add TargetModeAbort by initiator device handle
NEW FUNCTIONALITY: Added a new AbortType for TargetModeAbort Request to abort all I/Os from a single initiator.

(SCGCQ00339375) Enhancement 6/13

HEADLINE: Turn on Allow Table-to-Table Links bit in SAS IO Unit Page 1 in default NVDATA.
NEW FUNCTIONALITY: Table-to-table links will be allowed if self-configuring expanders are present, otherwise the IO Unit reports table-to-table links as a topology discovery error.

(SCGCQ00343541) Enhancement 7/13

HEADLINE: Disable SGPIO Group ID support in Channel NVDATA XML's
NEW FUNCTIONALITY: This allows the use of manufacturing page 7 or default slot mapping setting for direct connected drive slots.

(SCGCQ00345215) Enhancement 8/13

HEADLINE: MPI2: Add new TargetModeAbort AbortType to only abort Command IUs
NEW FUNCTIONALITY: Add an AbortType for the TargetModeAbort request that only aborts Command IUs, without affecting Task IUs.

(SCGCQ00356796) Enhancement 9/13

HEADLINE: MPI2: Use Slot Information during Port Enable Event Replay option



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NEW FUNCTIONALITY: Added Use Slot Information during Port Enable Event Replay flag to Flags field of Manufacturing Page 7, to control whether Port Enable Event Replay events are ordered by PHY number or slot number.

(SCGCQ00357228)

Enhancement 10/13

HEADLINE: MPI2: Add OEM Identifier to BIOS Page 1

NEW FUNCTIONALITY: Added OEM Identifier to BiosOptions bits of BIOS Page 1

(SCGCQ00316300 - Port of SCGCQ00316114)

Enhancement 11/13

HEADLINE: Add visibility into DDR training information

NEW FUNCTIONALITY: Added CLI command to dump DDR registers. Added compile option to enable DDR prints which is normally disabled, but can be easily re-enabled.

(SCGCQ00319944 - Port of SCGCQ00315229)

Enhancement 12/13

HEADLINE: Security freeze SATA devices at init time

NEW FUNCTIONALITY: Firmware will send a Security Freeze Lock command to all SATA devices during SATA init if this feature is enabled in NVDATA. The command will not be sent to a device if it does not support the Security feature set or if it is security locked.

Security freezing a SATA device causes most ATA Security commands sent to the device to fail. See the ATA command specification (ATA8-ACS, ACS-2) for details.

The NVDATA flag is IO Unit Page 1 Flags field bit 14.

(SCGCQ00348335 - Port of SCGCQ00337985)

Enhancement 13/13

HEADLINE: Target mode abort all IOs except Task IUs

NEW FUNCTIONALITY: This feature gives an option to the target driver to abort all IOs except Task IUs to the target controller. A new abort type MPI2_TARGET_MODE_ABORT_ALL_COMMANDS (0x06) has been introduced in firmware which can be used by the target driver to access this feature.



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Total NVDATA Changes (1)

(SCGCQ00346294)

NVDATA 1/1

HEADLINE: Initial check-in for SAS9208-8i and 9218-8i NVDATA

NEW FUNCTIONALITY: New Channel board NVDATA 9208-8i and 9218-8i D1 chip
