

ReleaseOrder ID:

SCGCQ01595407

Headline:

GCA: LSI_SAS3 v2.51.24.00 Phase 16 Windows Driver

Release Version:

2.51.24.00

UCM Project:

WINDOWS_MPT_GEN3_PHASE16.0

UCM Stream:

WINDOWS_MPT_GEN3_PHASE16.0_MAIN_DEV

Release Type:

GCA

State:

Deployed

Release Baseline:

WINDOWS_MPT_GEN3_PHASE16.0_Int_whql_2018-04-23@
\\SAS2

Release Date:

26-APR-18

Date Generated:

May 09, 2018

Defects Fixed (1):

ID:

SCGCQ01595391

Headline:

SAS3 Phase-16:- Additional universal driver support fails with MS DCHU tool

Description Of Change:

The error was : Needed section [PciloSpaceNotRequired] missing .Hw suffix . All the instances of PciloSpaceNotRequired in both production and Inbox INF file is suffixed with .HW

Issue Description:

when the DCHU check ran and the results indicate driver is Universal, but not Declarative".

Steps To Reproduce:

when the DCHU check ran and the results indicate driver is Universal, but not Declarative".

Release History

- [SCGCQ01581891 - Alpha: LSI_SAS3 v2.51.23.00 Phase 16 Windows Driver](#)
- [SCGCQ01538509 - Pre-Alpha: LSI_SAS3 v2.51.22.00 Phase 16 Windows Driver](#)

ReleaseOrder ID:

SCGCQ01581891_ [Open In CQWeb](#)

Headline:

Alpha: LSI_SAS3 v2.51.23.00 Phase 16 Windows Driver

Release Version:

2.51.23.00

UCM Project:

WINDOWS_MPT_GEN3_PHASE16.0

UCM Stream:

WINDOWS_MPT_GEN3_PHASE16.0_MAIN_DEV

Release Type:

Alpha

State:

Test_Complete

Release Baseline:

WINDOWS_MPT_GEN3_PHASE16.0_v2512300_Int_2018-02-05@
\\SAS2

Release Date:

15-FEB-18

Date Generated:

May 09, 2018

Defects Fixed (1):

ID:

SCGCQ01418985

Headline:

Driver signing script needs to change to be compatible with new certificate from Symantec

Description Of Change:

Changed syntax of signtool command used for Windows 8 and Windows 8.1 signatures to the following.

signtool sign /v /ac %VLHSIGN%\VeriSign_Universal_Root_Certification_Authority.cer /f %VLHSIGN%\SHA2.pfx /p "stephens" /fd sha256 /tr http://sha256timestamp.ws.symantec.com/sha256/timestamp/td %3 %4 %5

Issue Description:

Note that the cross signing certificate VeriSign_Universal_Root_Certification_Authority.cer must be added to the %VLHSIGN% directory (normally c:\Certificates).

Issue Description:

Driver signing script needs to change to be compatible with new certificate from Symantec

Steps To Reproduce:

Just try to build and sign drivers for Windows 8 or Windows 8.1' and the signing will fail.

Enhancements Implemented (2):

ID:

SCGCQ01519704

Headline:

WS2016 DCHU Compliance for SAS3 Phase 16 IT Windows Drivers

Description Of Change:

The Microsoft Windows Server team has removed the DEVFUND-0046 requirement to have the driver INF file also install a CLI utility for configuring the installed device. This change in requirements is what allows us to remove the below items from the INF file.

The wdcfg.exe, DriverConfigParam.def, and User Guide - Windows Driver Configuration Utility.pdf files removed from the driver installation packages and the driver INF file is also modified to remove all the instances of WDFCG and its pertinent files.

ID:

SCGCQ01581733 (Port Of EnhancementRequest SCGCQ01354909)

Headline:

Add support for SAS Device Discovery Error Event

Description Of Change:

When FW tries to discover the expanders in topology , it sends many SMP commands to expanders as part of discovery. For any reason if the SMP commands time out or fail persistently, FW gives up and does not discover the expander. In that event FW sends a new type of event to host known as SMMPI2_EVENT_SAS_DEVICE_DISCOVERY_ERROR to let host driver notify user that the SMP command timed out or failed and the expander is not discovered by FW.

I windows the string should be displayed as "SMP command sent to the expander by FW failed/timed out" and driver logs an event mentioning the reason code and the expander Dev handle. From LSB 1st byte gives ReasonCode, next 2 bytes give Expander DevHandle 4th byte says 0x0D (for SAS Device Discovery Error).

So the typical value should look like 0x0D****01 or 0x0D****02 where **** is the Dev handle of expander to which the commands timed out or failed.

01 reason code = MPI25_EVENT_SAS_DISC_ERR_SMP_FAILED and 02 reason code = MPI25_EVENT_SAS_DISC_ERR_SMP_TIMEOUT .

There are other important data is available in the event data sent by FW like sas address , physical port number . But the log error currently is designed to have only a 4 byte DWORD along with a useful string. In future the log error implementation can be modified to have more data bigger than a DWORD, in that case it would be useful to record the SAS address of the expander and may be the port number as well.

ReleaseOrder ID:

SCGCQ01538509_ [Open In CQWeb](#)

Headline:

Pre-Alpha: LSI_SAS3 v2.51.22.00 Phase 16 Windows Driver

Release Version:

2.51.22.00

UCM Project:

WINDOWS_MPT_GEN3_PHASE16.0

UCM Stream:

WINDOWS_MPT_GEN3_PHASE16.0_MAIN_DEV

Release Type:

Pre-Alpha

State:

Test_Complete

Release Baseline:

WINDOWS_MPT_GEN3_PHASE16.0_v2512200_Int_2017-12-19@
\\SAS2

Release Date:

31-JAN-18

Date Generated:

May 09, 2018

Defects Fixed (7):

ID: SCGCQ01537666 (Port Of Defect SCGCQ01487862)

Headline: Host-Based FW Diag Buffer commands fail on Ventura driver

Description Of Change: if((IOCStatus != MPI2_IOCSTATUS_SUCCESS) || pCurrentBuffer->OwnedByFirmware)
 pDiagSrb->Sic.ReturnCode = RttIoctlData.SicStatus = MPI_FW_DIAG_ERROR_RELEASE_FAILED;
 else
 pDiagSrb->Sic.ReturnCode = RttIoctlData.SicStatus = MPI_FW_DIAG_ERROR_SUCCESS;

to:

 if((IOCStatus != MPI2_IOCSTATUS_SUCCESS) || !pCurrentBuffer->OwnedByFirmware)
 pDiagSrb->Sic.ReturnCode = RttIoctlData.SicStatus = MPI_FW_DIAG_ERROR_RELEASE_FAILED;
 else
 {
 pDiagSrb->Sic.ReturnCode = RttIoctlData.SicStatus = MPI_FW_DIAG_ERROR_SUCCESS;
 pCurrentBuffer->OwnedByFirmware = FALSE;
 }
 }

Issue Description: This needs to be fixed in support of the J2010 training being presented to Microsoft on Nov. 1, 2017.

The following will reproduce the issue. Both the Release and the unregister commands will fail.

1.Configure & Initialize Host-Based FW Diag Buffer
a.RegEdit to Configure
KEY: DriverParameter @ HKEY_LOCAL_MACHINE\System\CurrentControlSet\Services\ItSas35\Parameters\Device
VALUE: EnaDiag = 1;TBufferSize = 4000000;TImmed = 1;
b.Restart Driver to Initialize

2.Upload the Host-Based FW Diag Buffer into a binary file
a.ScrutinyCLI I 1 db -register trace size 128
b.ScrutinyCLI I 1 db -release -trace
c.ScrutinyCLI I 1 db -read trace size 128 file <filename>
d.ScrutinyCLI I 1 db unregister trace

Steps To Reproduce: The following will reproduce the issue. Both the Release and the unregister commands will fail.

1.Configure & Initialize Host-Based FW Diag Buffer
a.RegEdit to Configure
KEY: DriverParameter @ HKEY_LOCAL_MACHINE\System\CurrentControlSet\Services\ItSas35\Parameters\Device
VALUE: EnaDiag = 1;TBufferSize = 4000000;TImmed = 1;
b.Restart Driver to Initialize

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ID: SCGCQ01537667 (Port Of Defect SCGCQ01507840)

Headline: Ventura B0 Phase 6: Driver does not appear to be returning anything after issuing link reset, sometimes

Description Of Change: The fix is when we do clean up IOCTL during Diag Reset we only check for IOCTLActive . But along with IOCTLActive Flag ,IoctlSavedSrb value should be checked as well.

Issue Description: When running the IOTM test to include more TMs than originally tested with, the script appeared to get stuck. However, upon closer inspection, it appears that SAL is issuing a link reset, but never getting a return status/code. Logs attached.

Test Configuration:
--WinServer 2016
--3 NVMe switch attached drives, 1 NVMe direct attach, 6 expander attached mix of SAS & SATA, and a couple DA SAS/SATA

Steps To Reproduce: Run IO tm script attached in defect with cmd line listed in cmdIOTMJRS.txt (or something close). Can take a while. Have SAS/SATA/NVMe, expander, direct attach, and switch.

ID: SCGCQ01537699 (Port Of Defect SCGCQ01517436)

Headline: Unexpected ItSas35 error in the system event log during I/O stress

Description Of Change: In the ISR, LsiCompleteIO and CompleteNvmeEncapCommand we do logging the MPI_LOG_NULL_SRB_BAD_CONTEXT event, but it is invalid when it hits for Static Messages . A check is added in all the three places to avoid this invalid event for Static Messages.

Issue Description: Unexpected ItSas35 error (MPI_LOG_NULL_SRB_BAD_CONTEXT) in the system event log during I/O stress

Steps To Reproduce: Issue occurred while running IoMeter during stress testing on certain setups.

ID: SCGCQ01537702 (Port Of Defect SCGCQ01529053)

Headline: SAS3.5 Windows Driver:- Target resets failed on some drives while IOs are in progress

Description Of Change: In CheckMpIoctlReply routine, we only check for IOCTLActive , however it should be checked coupled with IoctlSavedSrb for processing the MPI IOCTL reply. Because of missing check for IoctlSavedSrb , sometimes IOCTLs were not completed with success status.

Issue Description: Config details:-

HBA:- Ventura (9400-16i)
Driver:- 2.60.52.00
FW :- 05.250.08.00
OS:- windows 8 x64 client

server --> HBA --> Direct attached enclosure (SAS/SATA)

>>Enumerate all the drives after installing the driver
>>Started IOs on all the drives and kept the IO load running for 15mins.
>> started Issuing TMs to all the drives.
>>found Target reset failing on many drives. after some iteration of the TMs found all the target resets triggered got failed.

Steps To Reproduce:

-Enumerate all the drives after installing the driver
-Started IOs on all the drives and kept the IO load running for 15mins.
-Started Issuing TMs to all the drives.
-Found Target reset failing on many drives. after some iteration of the TMs found all the target resets triggered got failed.

ID: SCGCQ01537765 (Port Of Defect SCGCQ01452758)

Headline: BSOD is seen on windows 2016 while doing expander hot plug

Description Of Change: Inside CleanUpIoctl routine , we were filling RTT logging data even when the ExSrb /Srb was Null therefore causing the BSOD. The filling of logging data was moved to a if check for valid ExSrb /Srb.

Issue Description: With expander hotplug connected to ventura controller, BSOD is hit on Windows 2016

Steps To Reproduce: 1. On the MS setup load driver version - 2.60.46.00.
2. Launch scrutiny and do discovery and at the same time do hotplug of expander .
3. While doing some 5 iterations, BSOD is seen on Windows 2016.

ID: SCGCQ01538496 (Port Of Defect SCGCQ01458257)

Headline: UAR ATS TIMEOUT Improper handling

Description Of Change: When the ATS times out (as sent as part of UAR processing) , then the LUN reset which triggered sending the ATS returned with an error status, so Storport would escalate to a target reset.

Issue Description: If the ATS times out (in UAR state machine)(so it is still active in FW), then the LUN reset which triggered sending the ATS should be returned with an error status, so Storport will escalate to a target reset.

Steps To Reproduce: This has been found by code review .

ID: SCGCQ01538500 (Port Of Defect SCGCQ01518980)

Headline: Sequential write to SMR drive failed with err=5

Description Of Change: The fix was to add code in our driver to resynchronize the timer system to the corrected system clock on the next timer service interval. The TUR timed out resulting in a LUN reset and avoiding the diag reset.

The test app is outside our control, but I explained to the partner that they are likely to see busy status returns under normal operation and should delay-retry instead of erroring out.

Issue Description: The Windows system clock was getting 2 hours ahead, then correcting. Our driver timer system was turning a 2 second timer into a 2 hour + 2 second timer due to the system clock correction. This was causing a TUR to a bad drive to not timeout as intended which resulted in a diag reset of the adapter. During the diag reset, the test app was sending a SCSI Passthrough IOCTL to a good drive to set the write pointer, which was being returned with busy status due to the blocked queue (driver must block adapter queue to process diag reset). The test app interpreted the busy status incorrectly as an error instead of doing a delayed retry.

Steps To Reproduce: I think currently we are not focusing on FIO errors. If reset failed then write pointers on SMR drives will be out of sync with the offset from where FIO test is going to start and FIO failure on SMR region will occur.
The partner is trying to understand, during write pointer reset when one drive (A) failed due to I/O error why the next drive (B) shows similar I/O error and why other drives (C) hit unit attention error.

Whenever reset failed on few nodes we have, it failed as described in below scenario:
Z Z Z Z Z Z Z A B C C C C C C C C C C

Z: SMR HDDs on which write pointer reset worked
A: First SMR HDD which hit I/O device error during write pointer reset command
B: Second SMR HDD which hit I/O device error during write pointer reset command
C: SMR HDDs on which unit attention error occurred during write pointer reset command

It looks like drive A is bad and failed showing I/O device error, ZT has following questions:
Does HDD B is also bad? ZT doesnt think so because we have multiple nodes with same failure. If not, why HDD B is also seeing I/O device error?
How HBA is handling a bad SMR drive situation?
Does HBA reset all the drives which comes after the failing drive?

The partner is using SG3 Utils which have implemented a few SMR based utils that help work with the new T10/T13 spec for SMR drives.
There is no corresponding set of native tools currently for Windows the binaries for SG3_Utils available on this page
http://sg.danny.cz/sg/sg3_utils.html

Before a new FIO test is started, the write pointers are all reset (well, attempted to be reset before the observed problem occurs). This should be something simple to be able to start the tests over again and avoid any errors yet its proving to be a bit problematic due to unknown reasons as previously described.

The command that is used for the write pointer reset is sg_reset_wp and is what is sometimes causing the cascaded failures that were reported.

Example (pd37 is one of the HDDs, PhysicalDisk37 on a partner system under test):

Reset Command Abort:
C:\Users\Administrator\Desktop\smr_test\scripts>C:\Users\Administrator\Desktop\smr_test\sg_util_1.42\sg_reset_wp.exe --all pd37
Reset write pointer command: Aborted command

Reset Command Fail:
C:\Users\Administrator\Desktop\smr_test\scripts>C:\Users\Administrator\Desktop\smr_test\sg_util_1.42\sg_reset_wp.exe --all pd37
reset write pointer:
Fixed format, current; Sense key: Unit Attention
Additional sense: Power on, reset, or bus device reset occurred
Reset write pointer command: Unit attention

The drives in use are Host Managed SMR ATA devices and those follow the ZAC standard (which is closely related to the T10 - ZBC standard)

T13 Spec docs:
http://www.t13.org/Documents/UploadedDocuments/docs2015/di537r05-Zoned_Device_ATA_Command_Set_ZAC.pdf
http://www.t13.org/documents/UploadedDocuments/docs2016/di529r14-ATAATAPI_Command_Set_-_4.pdf

Additional details from the partner:
We need to use fio to do our testing, and we understand the restrictions of the SMR drives.
So weve come up with a scenario that we believe "should" work.

Each time we want to run an IO test we do something like this:
- Reset all the zone pointers on all the drives
- Loop over the command sg_reset_wp all pdXXX for all drives.
- Run an IO profile that does:
Logically creates either 4 or 10 tasks per drive.
Each task does 1MB sequential write IO at queue depth 1 at a different offset to the drive.
Runs each slice for either 4GB of 32GB into its slice, so that they never overlap.

With this pattern we believe that there should be no SMR violations because each zone is being written sequentially
AND we reset the pointers before we started.

So, there are some caveats:
- We know that the fio tool doesnt re-order any IOs.
- Were assuming that the HBA firmware doesnt re-order any IOs weve discussed this with your team and youve told us that it doesnt.
- Were assuming that the BRCM driver doesnt re-order any IOs weve discussed this with your team and youve told us that it doesnt.
- We have the disk drive caches disabled, which should prevent any chance of the drive re-ordering anything.
- Were assuming that nothing in the windows stack re-orders any IOs.
- Were not 100% sure about this yet weve received a new version of storport.sys that has some bug fixes in this area and were talking with MSFT all the time to make sure that no new issues have come up at that layer.

Enhancements Implemented (1):

ID: SCGCQ01510059
Headline: INF file update for 4 part PnP IDs
Description Of Change: Both production and Inbox INF files are updated.