BROADCOM Release Notes: SAS4 : Windows Driver 8.01.17.00 Release Order.

ReleaseOrder ID:	***DCSG01171769***
Headline:	***SAS4 : Windows Driver 8.01.17.00 Release Order.***
Release Version:	***8.01.17.00-WHQL***
UCM Project:	***MPI3X_WINDOWS_DRIVER***
Sub UCM Project:	***MPI3X_WINDOWS_DRIVER_MR8.1***
UCM Stream:	***MPI3X_WINDOWS_DRIVER_MR8.1_Rel***
Release Type:	***GCA***
State:	***Released***
Release Baseline:	***MPI3X_WINDOWS_DRIVER_MR8.1_Rel_2022-04-22@\SAS4***
Release Date:	***2022-03-24 10:10:34.000000***
Date Generated:	***Apr 29, 2022***

Defects Fixed (3):

ID:	DCSG01163669
Headline:	Update DOWNLOAD/Activate Flags for HBA FW Download
Description Of Change:	Driver will set the MPI3_CI_DOWNLOAD_MSGFLAGS_LAST_SEGMENT Flag for the LAST segment in an component image. Created a Separateroutine for SGL building so that its consumed for HBA FW IOCTL only.
Issue Description:	For DOWNLOAD/ACTIVATE Flags , Driver needs to set the MPI3_CI_DOWNLOAD_MSGFLAGS_LAST_SEGMENT FLAGS for the download to stored in secondary location of the flash and trigger activate . Along with with this Driver also need to set Activate function/reply in the SoftReset so that the ACTIVATE IOCTL is completed . This will enable to pass the WHQL tests for the same.
Steps To Reproduce:	Run the HBA FW Download WHQL test.

ID:	DCSG01167418
Headline:	AV1_8.1: BSOD - "DRIVER POWER STATE FAILURE " - System reboot with preservedcache
Description Of Change:	The change is to unpause the target device if it is paused when the driver gets target not responding event from FW. This will help to maintain the pause/unpause sequence of the device in upper layer and the plug and play (PnP) manager works fine without any issue.
Issue Description:	when the driver gets the "target not responding (MPI3_EVENT_SAS_TOPO_PHY_RC_DELAY_NOT_RESPONDING)" event, it pauses the device, it only unpauses the device when "responding event (MPI3_EVENT_SAS_TOPO_PHY_RC_RESPONDING)" comes. However it was not unpasuing the device when the target gets completely removed and we get target not responding event (MPI3_EVENT_SAS_TOPO_PHY_RC_TARG_NOT_RESPONDING) which causes churns in pause and unpause sequence of device in upper layer causing the plung and play manager hung forever. Becuase of plung and play manger gets hung, when the system shutdown or restart gets issued, the shutdown thread cant not get invoked becuase it was waiting on a lock (pnp lock) holding by the plug and play manger causing a deadlock and system crash.
Steps To Reproduce:	This issue seen on Windows 8.1 RAID test-configuration on 9660-16i raid controller. Generated the preserved cache . Check the storcli2 app - preserved cache generated . Reboot the system . After few minutes system goes to BSOD "DRIVER POWER STATE FAILURE".

ID:	DCSG01166660 (Port Of Defect DCSG01165072)
Headline:	Host Diagnostic Buffer Post failed after Release, Pause and Resume operations
Description Of Change:	The host diagnostic buffer status change event handler is modified to update the status of the host diagnostic buffers only when they are posted to the firmware. Otherwise, the buffer status change event is ignored.
Issue Description:	In the host diagnostic buffer status change event handler, the driver updates the status of the host diagnostic buffers without checking whether a specific buffer is actually registered by the driver with the firmware or not, this results in modifying the status of an already released buffer. The change of a previously released buffer to paused or resumed state will result in failure of re-registration of the buffer.
Steps To Reproduce:	1. Boot into a system with a controller under test attached 2. Make sure the driver is loaded and the controller is operational 3. Verify the host diagnostic buffers are registered by using scrutiny with db -query 4. Release the trace buffer using scrutiny with db -manage -trace -action 1 5. Verify the host trace buffer is in the released state by using scrutiny with db -query 6. Pause the trace buffer using scrutiny with db -manage -trace -action 2 7. Resume the trace buffer using scrutiny with db -manage -trace -action 3 8. Post the trace buffer using scrutiny with db -register -trace and observe it fail.

Enhancements Implemented (1):

ID:	DCSG01123585
Headline:	A new OEM IDs added
Description Of Change:	New OEM ID added

Release History

- **DCSG01165206 - SAS4 : Windows Driver 8.01.16.00 Release Order.**
- **DCSG01159098 - SAS4 : Windows Driver 8.01.15.00 Release Order.**
- **DCSG01151571 - SAS4 : Windows Driver 8.01.13.00 Release Order.**
- **DCSG01136580 - SAS4 : Windows Driver 8.01.12.00 Release Order.**
- **DCSG01122958 - SAS4 : Windows Driver 8.01.11.00 Release Order.**
- **DCSG01116559 - SAS4 : Windows Driver 8.01.10.00 Release Order.**
- **DCSG01110392 - SAS4 : Windows Driver 8.01.09.00 Release Order.**
- **DCSG01107988 - SAS4 : Windows Driver 8.01.08.00 Release Order.**
- **DCSG01099700 - SAS4 : Windows Driver 8.01.07.00 Release Order.**
- **DCSG01092352 - SAS4 : Windows Driver 8.01.06.00 Release Order.**
- **DCSG01090780 - SAS4 : Windows Driver 8.01.05.00 Release Order.**
- **DCSG01084262 - SAS4 : Windows Driver 8.01.03.00 Release Order.**
- **DCSG01083654 - SAS4 : Windows Driver 8.01.02.00 Release Order.**
- **DCSG01063898 - SAS4 : Windows Driver 8.01.01.00 Release Order.**
- **DCSG01053876 - SAS4 : Windows Driver 8.01.00.00 Release Order.**

ReleaseOrder ID:	***DCSG01165206*** Open In CQWeb
Headline:	***SAS4 : Windows Driver 8.01.16.00 Release Order.***
Release Version:	***8.01.16.00***
UCM Project:	***MPI3X_WINDOWS_DRIVER***
Sub UCM Project:	***MPI3X_WINDOWS_DRIVER_MR8.1***
UCM Stream:	***MPI3X_WINDOWS_DRIVER_MR8.1_Rel***
Release Type:	***Beta***
State:	***Released***
Release Baseline:	***MPI3X_WINDOWS_DRIVER_MR8.1_Rel_2022-03-16@\SAS4***
Release Date:	***2022-03-16 21:25:37.000000***
Date Generated:	***Apr 29, 2022***

Defects Fixed (7):

ID:	DCSG01132843

Headline: AV1: Driver failed to get RTTDUMP for failed AV1 controller
Description Of Change: When driver returns pending IOs when FW faults, it not returns NO_Device so that it tells OS that controller is present and can handle IOCTLs. THis allows RTT IOCTLs to pick rttTrace buffers
Issue Description: When FW faults, driver was returning IOs with No_HBA which indicates controller is gone. Storport will block any access to this device which also blocks RTT trace IOCTLS
Steps To Reproduce:
During one of the test, controller went to fault state. Fired the Storcli2 command to get rttdump, Where seen two issues .

ID: DCSG01147988
Headline: Avenger_8.1_Alpha: FAULT: 02000607
Description Of Change: Increased reply queue size across all MsiX vectors from 1 K descriptors to 4 K.

Note that this change significantly increases the memory allocated by the driver during initialization.
This could cause memory fragmentation in system memory if repetitive driver unloads/loads are done, such as testing driver upgrades in a loop.
If this occurs, the driver could fail to allocate memory during initialization and fail as a result.
While a few driver upgrades should not be an issue, anything causing the driver to be unloaded and reloaded, like driver upgrades, should not be tested in a repetitive loop.
Issue Description: The reply queues were being overrun faster than the driver could process the descriptors. The reply queues needd to be larger to provide more of a buffer for processing during peak times.
Steps To Reproduce: Step1:Create 64 ld's
Step2:Start IO
Step3:delete config
repeat 1-3

ID: DCSG01149552
Headline: AV1: PERC 12 PKG 18.39/Running CC, init and rebuild and trying to grab a snapdump on demand crashes the OS
Description Of Change: use of locks streamlined, so that they dont block each other
Issue Description: driver was grabbing a lock to update a struct, which was not needed. The EventAck lock was intended to be used to synchronize multiple threads adding events to the ACK queue.
When the actual ack completes we dont need to use the lock to mark the completion. By asking for the lock, we may not get it if some other thread is adding an event to the ack queue. This was causing the driver to spin on the CPU waiting for a lock(which was not needed) which leads to DPC watchDog timeout crash
Steps To Reproduce: Create an R0, R1 an R5.
Start full init on R0
Fail a PD on R1 nd start a rebuild
Start a CC an R5
Run a cli /cx get snapdump ondemand force and the OS will eventually crash and reboot.

ID: DCSG01158530
Headline: After installing the Windows Driver-MR8.1-8.01.14.00 in Win2019, version displayed by storcli and Device Manager is MR8.1-8.01.13.00
Description Of Change: re-release the driver with version 8.1.15.0
Issue Description: The release stream has the correct driver 14, but somehow the RO picked older driver. .Hence re-release the driver with different Version\RO
Steps To Reproduce: Install the Windows Driver - MR8.1-8.01.14.00. Reboot the System.
Check the driver version using storcli and after going to "Device Manager".

ID: DCSG01158816
Headline: AV1_8.1: BSOD - DPC WATCHDOG VIOLATION - during system reboot .
Description Of Change: In shutdown state machine, driver is waiting for longer time in a loop on IOC to complete the shutdown, that resulted the DPC timeout crash. The fix is to check the timer callback handle, if avaiable use it else spin to complete the shutdown state machine.
Issue Description: This issue seen on 8.1 WS 2022 test-configuration on 9660-16i RAID configuration.
Test-bed running with latest driver and Alpha FW.
Upgrade the driver to once again latest 8.1 driver. After driver upgrade , performed the FW update to latest 8.1 Beta package via OFU.
Performed the system reboot after Storcli2 throw a message FW update successful. During system reboot power on the enclosure connected to the 9660-16i controller
After few minutes Observed the BSOD with message "DPC WATCH DOG VIOLATION".
Steps To Reproduce: This issue seen on 8.1 WS 2022 test-configuration on 9660-16i RAID configuration.
Test-bed running with latest driver and Alpha FW.
Upgrade the driver to once again latest 8.1 driver. After driver upgrade , performed the FW update to latest 8.1 Beta package via OFU.
Performed the system reboot after Storcli2 throw a message FW update successful. During system reboot power on the enclosure connected to the 9660-16i controller
After few minutes Observed the BSOD with message "DPC WATCH DOG VIOLATION".

ID: DCSG01161197
Headline: To fix the postrel command for RO packaging.
Description Of Change: be sure to old the zip file. Copy the user information file to drivers directory
Issue Description: the post rel command does not clean up the existing zip package correctly.
Steps To Reproduce: the post rel command does not clean up the existing zip package correctly.

ID: DCSG01161571
Headline: Avenger : windows inf file copyright date is wrong
Description Of Change: updated the copyright to 2022
Issue Description: in the inf file the copyright was 2021
Steps To Reproduce: Windows Ini file date needs to be changed accordingly.

ReleaseOrder ID: ***DCSG01159098*** Open In CQWeb
Headline: ***SAS4 : Windows Driver 8.01.15.00 Release Order.***
Release Version: ***8.01.15.00***
UCM Project: ***MPI3X_WINDOWS_DRIVER***
Sub UCM Project: ***MPI3X_WINDOWS_DRIVER_MR8.1***
UCM Stream: ***MPI3X_WINDOWS_DRIVER_MR8.1_Rel***
Release Type: ***Beta***
State: ***Released***
Release Baseline: ***MPI3X_WINDOWS_DRIVER_MR8.1_Rel_2022-03-08.9942@\SAS4***
Release Date: ***2022-03-08 23:22:43.000000***
Date Generated: ***Apr 29, 2022***

Defects Fixed (2):

ID: DCSG01137944
Headline: "Hang" observed when scanning for devices after expander resets
Description Of Change: Changes made to handle the following events and pause/unpause a nonresponding device will help reduce the IO load on the device while it tries to recover.
MPI3_EVENT_SAS_TOPO_PHY_RC_DELAY_NOT_RESPONDING
MPI3_EVENT_SAS_TOPO_PHY_RC_RESPONDING
Issue Description: From the logs we see that even before the system is able to stabilize from the 1st reset, it gets hit with another reset.. this cascades the issue and the system spends a ton of time recovering. This causes all the peripheral things like DiskManager\Storcli to get backlogged. The IOs issued get stuck in the stack waiting for their time slice to be processed.
Steps To Reproduce: Run expander_reset.py script in a large config.

ID: DCSG01158530
Headline: After installing the Windows Driver-MR8.1-8.01.14.00 in Win2019, version displayed by storcli and Device Manager is MR8.1-8.01.13.00
Description Of Change: re-release the driver with version 8.1.15.0
Issue Description: The release stream has the correct driver 14, but somehow the RO picked older driver. .Hence re-release the driver with different Version\RO
Steps To Reproduce: Install the Windows Driver - MR8.1-8.01.14.00. Reboot the System.
Check the driver version using storcli and after going to "Device Manager".

ReleaseOrder ID: ***DCSG01151571*** Open In CQWeb
Headline: ***SAS4 : Windows Driver 8.01.13.00 Release Order.***
Release Version: ***8.01.13.00***
UCM Project: ***MPI3X_WINDOWS_DRIVER***

Sub UCM Project: ***MPI3X_WINDOWS_DRIVER_MR8.1***
UCM Stream: ***MPI3X_WINDOWS_DRIVER_MR8.1_Rel***
Release Type: ***Alpha***
State: ***Released***
Release Baseline: ***MPI3X_WINDOWS_DRIVER_MR8.1_Rel_2022-02-28@\SAS4***
Release Date: ***2022-02-28 23:33:29.000000***
Date Generated: ***Apr 29, 2022***

Defects Fixed (3):

ID: DCSG01136980
Headline: AV1:OS boot-up taking more time to entering into OS as mpi3drv keep on polling - MonitorResetHistBitPollMode - When AV1 card at fault state during boot up
Description Of Change: use the driver defined 30secs, to wait for the FW fault bit to toggle.. this will speed things up.
510 is to be used for FW INIT command
Issue Description: Windows driver uses timeout value (510 sec) provided by FW. Since FW is faulted and cannot boot, driver waits for 510 secs, and then does 3 retries and gives up.. This all takes almost 45 mins to complete hence this delay is seen in system booting up
Steps To Reproduce: This issue seen on Windows system on 8.1 test-configuration.
Test-configuration has AV1 controller, which goes into fault state during bootup . Measured the OS boot up time on all three tier-1 os'es.

Windows OS - Taking 45 minutes to boot into OS.

ID: DCSG01142545
Headline: Set the HBA FW Download IOCTL Timeout Value to 180 Seconds
Description Of Change: Updated the IOCTL Data Timeout Value to 180 seconds.
Issue Description: In the HBA FW Download IOCTL , set the timeout value we track in Watchdog timer to 180 second. Since HBA FW Download IOCTL requires the download firmware and ACTIVAT function which involves driver triggering soft reset . Currently the timeout value is set to 60 seconds . This is not enough as softreset may time depending on the config. So this timeout value should be set to 180 Second similar to previous generations.
Steps To Reproduce: This defect can repro intermittently if the DOWNLOAD IOCTL takes time to complete and watchdog timer runs more than 60 seconds leading to softReset.
Run WHQL test of HBA FW Download . Sometimes softreset is triggered by Driver due to IOCTL Timeout.

ID: DCSG01148424
Headline: Stop d1 encountered in Win 11 seep tests under Win11 HLK client install environment
Description Of Change: When driver detects that the memory is NULL, we reset the controller to make sure we carve correct memory and also inform the FW where the memory for the queues is.
we also make sure that when we are waking hibernation, we free the memory for the queues correctly so that when new memory is asked for, we dont havea leak.
StateMachine which handles the wakeup process the IOCFacts data and then frees memory and manages the DMAable\senseBuffer memory, this can take long time and hence this state is diveded into 2 seperate states to make sure we get enough time to process each state correctly
Issue Description: While waking up from hibernation, when driver tries to complete IOs, its hits a case where the memory is NULL which leads to crashing the system
Steps To Reproduce: 9660-16 with 2 raid volumes, can be R0.
Win 11 client OS
Windows workstation supporting TPM, CPU and memory requirements for win 11 to install (7920 currently)
HLK for win11
OS install to the controller. and HLK server/client configured
Run
- DF Sleep and PNP (disable and enable) with IO before and After.
- DF Sleep with IO during
Driver verifier will be running during the tests.
S3/S4 sequence is run with verifier options by the test, s4 resume gives D1 error.
Not seen, without HLK environment, no verifier , or win10 HLK test run

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ReleaseOrder ID: ***DCSG01136580*** Open In CQWeb
Headline: ***SAS4 : Windows Driver 8.01.12.00 Release Order.***
Release Version: ***8.01.12.00***
UCM Project: ***MPI3X_WINDOWS_DRIVER***
Sub UCM Project: ***MPI3X_WINDOWS_DRIVER_MR8.1***
UCM Stream: ***MPI3X_WINDOWS_DRIVER_MR8.1_Rel***
Release Type: ***Alpha***
State: ***Released***
Release Baseline: ***MPI3X_WINDOWS_DRIVER_MR8.1_Rel_2022-02-08@\SAS4***
Release Date: ***2022-02-08 23:25:13.000000***
Date Generated: ***Apr 29, 2022***

Defects Fixed (3):

ID: DCSG01089267
Headline: ARM64 release (not debug) builds have a bug in the BLDDRV.CMD script
Description Of Change: Corrected logic in BLDDRV.CMD script to correctly select copy logic for ARM64 release and debug build types.
Issue Description: ARM64 release (not debug) builds have a bug in the BLDDRV.CMD script which causes the copy of the final binaries into the target directory to fail.
Steps To Reproduce: Just try building a driver for ARM64 Release (not debug).

ID: DCSG01124252
Headline: AV1_8.0: Hibernation fails - DRIVER_IRQL_NOT_LESS_OR_EQUAL (d1) - hiber_mpi3drv+0x3a6a
Description Of Change: Before accessing the RBM struct, make sure that memory is allocated correctly for that struct
Issue Description: During Hibernation RBM feature is disabled and hence memory needed to manage this is not allocated; When driver tries to build an IO it tries to access DataStruct for RBM which causes it to access an unallocated buffer which causes the crash
Steps To Reproduce: OS installed behind AV1 card.
Performed the windows update.
Run the hibernation .
Driver failed to entering into hibernation state.

ID: DCSG01131838
Headline: Issues encountered attempting to build InBox (Release, Debug, Source) drivers
Description Of Change: Added Debug_InBox to check for Source builds, and fixed a few typos in the code.
Issue Description: Debug_InBox was not being checked for Source builds, and there were a few typos in the code.
Steps To Reproduce: Issue one of the following build commands on the IT driver.

```
MkDrv o:InBox c:x64 b:DbgRel s:HdcSign

MkDrv o:InBox c:Source
```

Enhancements Implemented (2):

ID: DCSG01059696
Headline: Add automatic mode of finding SDK/WDK tools to eliminate need to maintain search paths for multiple versions
Description Of Change: Added new attributes to each build target inside the Build Parameters configuration file, and enhanced build tools to use them to locate the build tools needed on a per WDK/SDK version basis.

ID: DCSG01129339
Headline: support WDK/SDK Version Targeting via BUILD tools changes
Description Of Change: support WDK/SDK Version Targeting via BUILD tools changes

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ReleaseOrder ID: ***DCSG01122958*** Open In CQWeb

Headline: ***SAS4 : Windows Driver 8.01.11.00 Release Order.***
Release Version: ***8.01.11.00***
UCM Project: ***MPI3X_WINDOWS_DRIVER***
Sub UCM Project: ***MPI3X_WINDOWS_DRIVER_MR8.1***
UCM Stream: ***MPI3X_WINDOWS_DRIVER_MR8.1_Rel***
Release Type: ***Alpha***
State: ***Released***
Release Baseline: ***MPI3X_WINDOWS_DRIVER_MR8.1_Rel_2022-01-20@\SAS4***
Release Date: ***2022-01-20 22:21:49.000000***
Date Generated: ***Apr 29, 2022***

Defects Fixed (3):

ID: DCSG01120349 (Port Of Defect DCSG01108444)
Headline: Controller not found after FW upgrade with offline activation & power pull/push
Description Of Change: Re-init was not happening properly when the reset history bit was getting cleared by the driver. A flag is added to track when the reset history bit is cleared by the driver and properly carries out the re-init sequence.
Issue Description: Re-init was not happening properly when the reset history bit was getting cleared by the driver and the re-init sequence was getting terminated.
Steps To Reproduce: 1. Boot with 8.0.0.200-00000-00006
2. Upgrade the FW to 8.0.0.200-00000-00007 with offline activation: storcli2 /c0 download file= 9670W-16i_full_fw_pkg_signed.rom activationtype=offline
3. Power off/on the host
4. After the boot controller is not getting discovered

ID: DCSG01116213
Headline: Events with event ID 44802 are logged as Error level after firmware update
Description Of Change: one event of the two is changed to WARNING level, another event is correctly identified as ERROR
Issue Description: one event of the two is changed to WARNING level, another event is correctly identified as ERROR
Steps To Reproduce: Have latest Driver and Firmware.

Clear the Windows events,

Execute

storcli2.exe /c0 download file = <Controller ROP file>

Once flashing is completed wait for 3-4 minutes and observe the events in the event viewer.

2 Events with event ID 44802 are logged as Error levels.

ID: DCSG01116648
Headline: AV1_8.0: Fault Code - 02000607 while running Host IO's on RAID arrays
Description Of Change: changes made were
1> make sure that the datalen to be reduced is saved and later used so the mismatch is avoided
2> add synchronization for DivertToFW variable to make sure Build\Interrupt context manage them correctly
3> add check to do RBM for RW IOs only to reduce scope of the changes
Issue Description: during buffer underrun cases, driver was not reducing the outstanding data size correctly; Instead of reducing the requested dataLen(which was originally added to the count) it reduced the count with data length passed by the FW.
Steps To Reproduce: This issue seen on 8.0 Windows test-configuration on RAID mode.
Create R5,R6,R1,R0 arrays , running Host IO (Choas) .
Deleting and creating vd in a loop, creating vd would part of Host IO .

ReleaseOrder ID: ***DCSG01116559*** Open In CQWeb
Headline: ***SAS4 : Windows Driver 8.01.10.00 Release Order.***
Release Version: ***8.01.10.00***
UCM Project: ***MPI3X_WINDOWS_DRIVER***
Sub UCM Project: ***MPI3X_WINDOWS_DRIVER_MR8.1***
UCM Stream: ***MPI3X_WINDOWS_DRIVER_MR8.1_Rel***
Release Type: ***Alpha***
State: ***Released***
Release Baseline: ***MPI3X_WINDOWS_DRIVER_MR8.1_Rel_2022-01-12@\SAS4***
Release Date: ***2022-01-13 01:55:13.000000***
Date Generated: ***Apr 29, 2022***

Defects Fixed (3):

ID: DCSG01098021
Headline: MR8.0_AV1 - FAULT: 02000607 is seen while mounting filesystem on 64VDs with cache bypass set to 128
Description Of Change: Make sure the counting of bandwidth is done correctly
Issue Description: Driver was incorrectly maintaining the largeIO outstanding bandwidth value for Controller and throttleGroups, which caused the IOThrottlings to be enabled\disabled randomly.

The reason for incorrectly calculating the BW is that diver gets an IO we calculate the correct BW; When we are about to fire the IO we realise the queue is full and we loop back in search for a new queue. For the new queue we redo the calculation. So for the same IO we calculated the BW twice and if we loop again, the issue is comprehended. When IO completes the BW is adjusted only once and this causing mismatch of the driver calculated values and the reality.

When driver thinks IOT is enabled, Driver then diverted IOs to FW which caused FW to generate events when it disabled IOThrottling. This caused pingPong of IO to the throttled or not... And a TON of events generated to handle the device status change information.
All this processing caused backlog of actual IO processing leading to this issue.
Steps To Reproduce: 1. Flash latest firmware ROP on 9660-16i controller > DCSG01095836
2. Boot to OS, start the attached script using wingman.
3. Creation of VDs is successful
4. As soon as the mounting of VDs start, the fault is seen.

ID: DCSG01108337
Headline: Host Diag Buffer state is showing as not allocated after controller reset.
Description Of Change: Changes incorporated to avoid resetting the buffers to UNALLOCATED during soft reset
Issue Description: During soft reset, driverpage1 values were getting compared again IOCFacts data and resetting the buffer state to UNALLOCATED. This step is only required at the start of the day and should not be done during soft reset.
Steps To Reproduce: 1. Update the controller with the latest FW and Driver. Issue "db query" command.- FW and trace buffers are showing in unpaused state
2. Issue reset command. - reset is successful.
3. Issue "db -query command" -both the buffers are showing as Not allocated instead of release state.

ID: DCSG01111906
Headline: BSOD - DRIVER_IRQL_NOT_LESS_THAN_EQUAL -D1 - During driver update on fault path
Description Of Change: When buffer is not allocated, which happens when MaxTGCount or MaxDevicesPerTG is 0. If we hit that case, we disable IOT for those devices. Once the feature is disabled, we will not access the data sturcts
Issue Description: Driver tries to access the ThrottleGroup struct, when the buffer is not allocated for it. This leads to BSoD
Steps To Reproduce: Trigger driver load on faulted controller

ReleaseOrder ID: ***DCSG01110392*** Open In CQWeb
Headline: ***SAS4 : Windows Driver 8.01.09.00 Release Order.***
Release Version: ***8.01.09.00***
UCM Project: ***MPI3X_WINDOWS_DRIVER***
Sub UCM Project: ***MPI3X_WINDOWS_DRIVER_MR8.1***
UCM Stream: ***MPI3X_WINDOWS_DRIVER_MR8.1_Rel***
Release Type: ***Pre-Alpha-1***
State: ***Released***

Release Baseline: ***MPI3X_WINDOWS_DRIVER_MR8.1_Rel_2022-01-04@\SAS4***
Release Date: ***2022-01-04 22:47:20.000000***
Date Generated: ***Apr 29, 2022***

Defects Fixed (3):

ID: DCSG01096773
Headline: BSOD driver_irql_not_less_or_equal observed with TC DCSG01005082
Description Of Change: Now access to TM pending pointer is atomic.
Issue Description: Internal TM issued triggered through interrupt context and Host initiated TMs through StartIO context are not Synchronous.
This causes Pending Frames to get lost because of threads over stepping on each other.
Steps To Reproduce: Run attached Script in loop for greater then 2 days

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ID: DCSG01106761
Headline: Avenger_IOT:Fault 0x300D004
Description Of Change: Make sure the count does not go -ve for the outstanding IO per TG
Issue Description: THe TG outstanding IO count goes -ve which causes driver to keep toggling DivertON\OFF which casuses a ton of Events generated for deviceStatusChange. Driver keeps processing these replies and delaying picking other replies
Steps To Reproduce:

Step1:Create following Vd's

```
storcli2.exe /c0 add vd R60 size=128GiB,128GiB,16GiB,128GiB,128GiB,16GiB,128GiB,128GiB,16GiB drives=330:0-7 pdperarray=4
storcli2.exe /c0 add vd R0 size=128GiB,128GiB,16GiB,128GiB,128GiB,16GiB,128GiB,128GiB,16GiB drives=330:24
storcli2.exe /c0 add vd R10 size=128GiB,128GiB,16GiB,128GiB,128GiB,16GiB,128GiB,128GiB,16GiB drives=330:25-28
storcli2.exe /c0 add vd R5 size=128GiB,128GiB,16GiB,128GiB,128GiB,16GiB,128GiB,128GiB,16GiB drives=330:29-31
```

Step2:Start BGOP's with IO's

```
storcli2.exe /c0 /v1-9 start cc force
storcli2.exe /c0 start pr
Start rebuild on R10
```

Step3: After some time create following vd's

```
storcli2.exe /c0 add vd R5 size=128GiB,128GiB,16GiB,128GiB,128GiB,16GiB,128GiB,128GiB,16GiB drives=330:29-31
storcli2.exe /c0 add vd R10 size=128GiB,128GiB,16GiB,128GiB,128GiB,16GiB,128GiB,128GiB,16GiB drives=330:25-28
storcli2.exe /c0 add vd R60 size=128GiB,128GiB,16GiB,128GiB,128GiB,16GiB,128GiB,128GiB,16GiB drives=330:0-7 pdperarray=4
storcli2.exe /c0 show
```

Step4: Pull Pd's and make vd degraded and let io continue after some time insert pd's

---

ID: DCSG01109059 (Port Of Defect DCSG01108017)
Headline: MR8.1-PA3: DB query displays trace buffer as released instead of FW buffer
Description Of Change: Make sure correct buffer is released
Issue Description: driver was hardcoding the buffer type which caused incorrect buffer to be released
Steps To Reproduce:

```
SAS4016 B0> db -query
SAS4016 B0> db -manage -fw -action 1
SAS4016 B0> db -query
SAS4016 B0> quit
```

after releasing FW buffer, trace buffer is shown as released

ReleaseOrder ID: ***DCSG01107988*** Open In CQWeb
Headline: ***SAS4 : Windows Driver 8.01.08.00 Release Order.***
Release Version: ***8.01.08.00***
UCM Project: ***MPI3X_WINDOWS_DRIVER***
Sub UCM Project: ***MPI3X_WINDOWS_DRIVER_MR8.1***
UCM Stream: ***MPI3X_WINDOWS_DRIVER_MR8.1_Rel***
Release Type: ***Pre-Alpha-1***
State: ***Released***
Release Baseline: ***MPI3X_WINDOWS_DRIVER_MR8.1_Rel_2021-12-28.9450@\SAS4***
Release Date: ***2021-12-29 00:15:38.000000***
Date Generated: ***Apr 29, 2022***

Defects Fixed (4):

ID: DCSG01093544
Headline: After cable pull/Push or power off/On the Atlas, NVMe PDs are going to UG_BAD state and PDs are not visible by storcli unless performing the controller reset
Description Of Change: made sure that the check to remove device is correct
Issue Description: we had an incorrect check, which caused removal of device to be skipped
Steps To Reproduce:
1) Make a X4 connection (single cable) of NVMe drives using Atlas.
2) Boot to OS. Using storcli, make sure all the PDs are visible.

3) Now using cable breaker, make the x4 connection off. Wait for 5 minutes and make the connection ON.
4) Wait for 5 minutes.

5) Run the below command to check if the PDs are visible
6) storcli2 /c0 show.
7) Run "pdinfo" in the UART to check the PD state
Or

8) Power off the Ibanex and After waiting 2 minutes, power on the Ibanex.
9) Run storcli2 /c0 show.
10) Run "pdinfo" in the UART to check the PD state

ID: DCSG01099940
Headline: PA3 - AV1-IOC : After server reboot Diag trace/FW buffers are showing as not allocated.
Description Of Change: The IOC FACT values for diag buffer are in bytes , not in KBs.Driver was considering the IOCFACT Diag buffer values in KBs which is chagned to bytes.
Issue Description: PA3 - AV1-IOC : After server reboot Diag trace/FW buffers are showing as not allocated.
Steps To Reproduce:
Controller - 9600-16e/9600-16i -Feature IT mode
OS - Windows Server 2019.
Firmware Version : 8.1.0.9-00000-00028
Driver Version : 8.01.07.00

1.Install the latest driver and FW in windows 2019 system.
2.Reboot the server and verify the dig buffer details using the scrutiny db commands.

Buffer size is showing as "0KiB" and not allocated. Attached FW and driver logs.
Snapdump is returning the HW trace buffer log. Attached the snapdump also.

```
SAS4016 B0> db -query
Number of Host Diagnostic Buffers Supported : 2

BufferType          : Trace
Status              : Not Allocated
Trigger Type        : Unknown
Size                : 0 KiB
Trigger Data        : 0x0

BufferType          : Firmware
Status              : Not Allocated
Trigger Type        : Unknown
Size                : 0 KiB
Trigger Data        : 0x0
```

ID: DCSG01100756
Headline: Driver does not clear the TMActiveSrb after reset
Description Of Change: When returning IOs back to OS during reset, we make sure TMActiveSrb is cleared for internal\Os\Applications generated TMs
Issue Description: During reset, when driver returns all IOS back to OS, if internal TM is found pending, we cancel it, but do not mark it completed
Steps To Reproduce: Code walk thru

this will happen when Internal Remove device TM times out. TMs issued by OS\applications are covered.

ID: DCSG01102851
Headline: AV1 -8.1- Windows driver package is not having the ARM driver but Read me is updated with ARM driver details.
Description Of Change: The readme is updated with the below NOTE :

" The Driver Release Order(RO) may not have all the OSes listed above, please refer the description
of OS Drivers which are present in RO."

The above is satisfactory if any OS support is moved out from the RO.

Issue Description: In latest Windows driver release MR8.1-8.01.07.00-DCSG01099700 , Read me is having the Win2019_Server_RS5_LTSC_f18_ARM64 details in the list of drivers support but build package is not having the ARM build.
Steps To Reproduce: In latest Windows driver release MR8.1-8.01.07.00-DCSG01099700 , Read me is having the Win2019_Server_RS5_LTSC_f18_ARM64 details in the list of drivers support but build package is not having the ARM build.

ReleaseOrder ID: ***DCSG01099700*** Open In CQWeb
Headline: ***SAS4 : Windows Driver 8.01.07.00 Release Order.***
Release Version: ***8.01.07.00***
UCM Project: ***MPI3X_WINDOWS_DRIVER***
Sub UCM Project: ***MPI3X_WINDOWS_DRIVER_MR8.1***
UCM Stream: ***MPI3X_WINDOWS_DRIVER_MR8.1_Rel***
Release Type: ***Pre-Alpha-1***
State: ***Released***
Release Baseline: ***MPI3X_WINDOWS_DRIVER_MR8.1_Rel_2021-12-16@\SAS4***
Release Date: ***2021-12-17 00:43:23.000000***
Date Generated: ***Apr 29, 2022***

Defects Fixed (5):

ID: DCSG01054372
Headline: FW Fault (05008454) seen.
Description Of Change: We received an read/write IO of 512 byte size for a VD which is not supported by FW, sending it down will result FW fault.
This should not have been sent by upper layer. This could be becuase of quick change in states of a VD, failure of certain commands from upper layer made the upper layer to send an IO with default 512 IO size. The fix is to send this IO with Busy, force a scan on that bus where the device is present, that would allow upper layer to tear the device instance from its list and re-populate the device again as part of this bus scan.
Issue Description: The PnP manger seems to be sending an read IO of size 512 bytes to a VD causing the FW to fault as the VD does not support 512 IO size it supports 4K .
Steps To Reproduce: A script is used to create /delete VDs , init Vds in a loop , after sometime and some rounds of execution of the script FW fault FAULT: 05008454 is seen.

ID: DCSG01093176
Headline: Unable to download controller FW with latest windows driver installed
Description Of Change: Changes incorporated to correctly handle the completion of firmware download command (MPI3_FUNCTION_CI_DOWNLOAD) via the pass-thru interface.
Issue Description: Firmware download command MPI3_FUNCTION_CI_DOWNLOAD via pass-thru interface was not completed correctly in the interrupt completion routine.
Steps To Reproduce: Boot the server with controller under test
Install latest driver version 8.01.06.00
Attempt to flash the controller FirnWare using CLI

ID: DCSG01093203
Headline: Intermittent very low performance in Windows using diskspd or iometer for 4k random reads with raid 0 writethrough configurations
Description Of Change: The change was added to make sure correct Throttle group is select when build\Complete of IO is done for a VD.
Issue Description: lookup for ThrottleGroup for a VD was incorrect, which caused us to incorrectly manage the Outstanding IOS on the TG.. BuildIO and CompleteIO were using different TGs and which leads to Divert staying ON the whole time once we hit the scenario
Steps To Reproduce: Run small automation project with different numbers of vds until the performance drops.

ID: DCSG01093789
Headline: AV1_8.1:BSOD -DPC_WATCH_DOG_VIOLATION during system reboot when AV1 ctrl at fault state
Description Of Change: When shutdown arrives and if driver is in middle of reset, we now backout from reset and complete the shutdown.
Issue Description: When FW is Faulted, driver tries to recover it with SoftReset,.. while this is happening if Shutdown arrives, Shutdown is processed and when issuing Shutdown commands to FW, these commands timeout, leading to WatchDog voilation.
Steps To Reproduce: WS 2022 OS installed on system pd. Updated the OS to latest patches
Simulated the scenario moved the AV1 card to fault state.
During which fired the storcli /c0 show command along with performed the system reboot. Which result to BSOD "DPC_WATCHDOG_VIOLATION"

ID: DCSG01096798
Headline: AV1: BSOD - D1 - DRIVER_IRQL_NOT_LESS_THAN_EQUAL - When switching IO size - Divert SET/RESET
Description Of Change: Driver was passing Incorrect TargetID and PathID when calling StorPortSetDeviceQueueDepth.
This was causing NULL pointer dereference. Fix is to pass only Valid TargetID and PathId.
Issue Description: This issue seen while running IO Throttle test-case.
Created RAID 0 vd.
Started FIO with IO size 4KB for 1 minutes.
Then switch the IO size to 128KB . Which result to BSOD.
Driver log has signature of mpi3mr and signature of SGL -- storport!RaidAdapterPostScatterGatherExecute+0x147

Below driver stack

```
---------------------
STACK_TEXT:
ffff988d`ed244058 fffff806`80b54962     : ffff988d`ed2441c0 fffff806`808f6270 fffff806`7fd42180 00000000`00000000 : nt!DbgBreakPointWithStatus
ffff988d`ed244060 fffff806`80b541ad     : fffff806`00000003 ffff988d`ed2441c0 fffff806`80a2b6f0 00000000`000000d1 : nt!KiBugCheckDebugBreak+0x12
ffff988d`ed2440c0 fffff806`80a161b7     : ffff988d`ed2449d8 ffff988d`ed244910 ffffb088`342f21a0 fffff806`80a1e6d5 : nt!KeBugCheck2+0xa7d
ffff988d`ed244820 fffff806`80a28b69     : 00000000`0000000a ffffb088`3530e98a 00000000`00000002 00000000`00000000 : nt!KeBugCheckEx+0x107
ffff988d`ed244860 fffff806`80a24cc0     : ffff7210`da272283 00000000`00040202 ffff988d`ed2449c0 00000000`00000000 : nt!KiBugCheckDispatch+0x69
ffff988d`ed2449a0 fffff806`866c3999     : ffffb088`343da010 ffffb088`343e0198 00000000`00000136 ffff988d`ed244c0c : nt!KiPageFault+0x440
ffff988d`ed244b30 fffff806`865beed7     : ffffb088`343da010 ffffb088`37724b80 ffffe781`9a51c030 00000000`00000000 : mpi3drv+0x3999
ffff988d`ed244df0 fffff806`865bddf2    : 00000000`00020000 00000000`00000000 00000000`00000000 00000000`00000000 : storport!RaidAdapterPostScatterGatherExecute+0x147
ffff988d`ed244e80 fffff806`808bc3d1     : ffffb088`386fdce8 00000000`00000318 00000000`00000000 ffffb088`342f2050 : storport!RaidpAdapterContinueScatterGather+0x42
ffff988d`ed244eb0 fffff806`808bc181     : ffffe781`9a51c030 ffffb088`342f2050 00000000`00000000 00000000`092bf530 : nt!HalBuildScatterGatherListV2+0x241
ffff988d`ed244f40 fffff806`865bf87b    : ffff988d`ed244fe0 00000000`00000000 00000000`00000000 00000000`00000021 : nt!HalGetScatterGatherList+0x61
ffff988d`ed244fd0 fffff806`865be2d3     : ffffe781`9a51c030 ffffb088`342f2050 00000000`00000328 00000000`092bf530 : storport!RaidDmaGetScatterGatherList+0x5f
ffff988d`ed245030 fffff806`865b9b0d     : ffffb088`39624d2a 01000000`00200382 ffff988d`ed2451d8 fffff806`00000001 : storport!RaUnitStartIo+0x4b3
ffff988d`ed245130 fffff806`865b93d5     : ffffb088`39624d30 ffffb088`38c27010 ffffb088`00000000 ffffb088`00000001 : storport!RaidStartIoPacket+0x4ed
ffff988d`ed245260 fffff806`865b917a     : fffff806`859dd500 ffffb088`34cdcd70 fffff806`86623000 00000000`00000000 : storport!RaUnitScsiIrp+0x215
ffff988d`ed245300 fffff806`80954bc5     : ffffb088`37f38c10 ffffb088`37f38c10 00000000`fb320000 00000000`00020000 : storport!RaDriverScsiIrp+0x5a
ffff988d`ed245340 fffff806`8706522d     : ffffb088`37f38c10 ffffb088`37f38c10 ffffb088`387ba100 ffffb088`387ba100 : nt!IofCallDriver+0x55
ffff988d`ed245380 fffff806`8706444c     : 00000000`00000000 00000000`00000000 ffffb088`37f38c10 00000000`00000020 : CLASSPNP!SubmitTransferPacket+0x2bd
ffff988d`ed2453d0 fffff806`87063876     : ffffb088`38b83050 ffffb088`39624d30 ffffb088`39624e00 00000000`000ff000 : CLASSPNP!ServiceTransferRequest+0x5ac
ffff988d`ed245480 fffff806`8706a714     : 00000000`00000000 0000001e`b4e8f647 0000001e`2d898299 fffff806`808a9e9e : CLASSPNP!ClassReadWrite+0x166
ffff988d`ed2455a0 fffff806`80954bc5     : fffff780`00000008 fffff806`863d764c ffffb088`3843e000 ffffb088`37f26a60 : CLASSPNP!ClassGlobalDispatch+0x24
ffff988d`ed2455d0 fffff806`863d18af    : 00000000`00000000 ffffb088`37f26a60 ffffb088`39624ed8 ffffb088`39624d30 : nt!IofCallDriver+0x55
ffff988d`ed245610 fffff806`863d1f10    : 00062a01`00000001 0000001e`b4e9001f ffffb088`39624d30 00000000`00000000 : partmgr!PmWrite+0x10f
ffff988d`ed245690 fffff806`80954bc5     : 00000000`00000000 fffff806`8088d673 00000000`0000001a 00000000`00000030 : partmgr!PmGlobalDispatch+0x20
ffff988d`ed2456c0 fffff806`80ce0800     : 00000000`00000000 00000000`000002c0 ffffb088`37e427e0 ffffb088`39624f20 : nt!IofCallDriver+0x55
ffff988d`ed245700 fffff806`80ce05d4     : ffffb088`39624d30 00000000`00000000 ffffb088`39622b80 ffff988d`ed245850 : nt!RawReadWriteDeviceControl+0xa0
ffff988d`ed245730 fffff806`80954bc5     : ffffb088`34cdcd70 ffffb088`39624d30 ffffb088`38605a70 00000000`00062a01 : nt!RawDispatch+0x74
ffff988d`ed245780 fffff806`859c637f    : 00000000`00000000 ffff988d`ed245860 ffff8480`00040001 00000000`00000000 : nt!IofCallDriver+0x55
ffff988d`ed2457c0 fffff806`859c3be3     : ffff988d`ed245850 00000000`00000001 ffff988d`ed2458b0 ffffb088`345e5080 : FLTMGR!FltpLegacyProcessingAfterPreCallbacksCompleted+0x27f
ffff988d`ed245830 fffff806`80954bc5     : ffffb088`39624d30 00000000`00000000 00000000`00000001 fffff806`810415fe : FLTMGR!FltpDispatch+0xa3
ffff988d`ed245890 fffff806`80d83379     : ffffb088`39624d30 00000000`00000000 ffffb088`39624d30 ffffb088`39624f68 : nt!IofCallDriver+0x55
ffff988d`ed2458d0 fffff806`80d7ba17     : ffffb088`37e42800 ffffb088`39624d30 00000000`0a16fc00 ffff988d`ed245b60 : nt!IopSynchronousServiceTail+0x189
ffff988d`ed245970 fffff806`80a28535     : 00000000`00000000 00000000`00000000 00000000`00000000 00000000`0931e490 : nt!NtWriteFile+0x667
ffff988d`ed245a70 00007ff8`d8b8eff4     : 00007ff8`d6475178 00000000`fb320000 00000000`00000001 00000000`01182850 : nt!KiSystemServiceCopyEnd+0x25
00000000`0a16fb88 00007ff8`d6475178     : 00000000`fb320000 00000000`00000001 00000000`01182850 00000000`00000001 : ntdll!NtWriteFile+0x14
00000000`0a16fb90 00000001`4004da73     : 00000000`0931e380 00000000`0931e490 00000000`00020000 00000000`00000000 : KERNELBASE!WriteFile+0x108
00000000`0a16fc00 00000000`0931e380     : 00000000`0931e490 00000000`00020000 00000000`00000000 00000000`fb320000 : fio+0x4da73
```

```
00000000`0a16fc08 00000000`0931e490     : 00000000`00020000 00000000`00000000 00000000`fb320000 00000000`09738f18 : 0x931e380
00000000`0a16fc10 00000000`00020000     : 00000000`00000000 00000000`fb320000 00000000`09738f18 00000000`0931e380 : 0x931e490
00000000`0a16fc18 00000000`00000000     : 00000000`fb320000 00000000`09738f18 00000000`0931e380 00000000`09738f10 : 0x20000
-------------------------------
```

Memory dump at below location - download the dump with file name of -- io_throttle_memory

https://broadcom.ent.box.com/folder/133352206556

Steps To Reproduce: This issue seen while running IO Throttle test-case.
Created RAID 0 vd.
Started FIO with IO size 4KB for 1 minutes.
Then switch the IO size to 128KB . Which result to BSOD.
Driver log has signature of mpi3mr and signature of SGL -- storport!RaidAdapterPostScatterGatherExecute+0x147

Enhancements Implemented (3):

ID: DCSG01065547
Headline: MPI 3.0 (24): Header file changes associated interim release 23.1
Description Of Change: Consolidate all header file changes needed for interim header release 23.1

ID: DCSG01083701
Headline: SAS4: Windows Driver: Add I/O Throttling Support.
Description Of Change: The Windowsdriver is enhanced to track cumulative pending large data size at the controller level and at the throttle group level and when one of the value meet or exceeds the controller firmware determined high threshold values then the driver will divert future selective I/O to the firmware. Once both controller level and at the throttle group level cumulative pending large data size reach controller firmware determined low threshold values the driver will stop diverting I/Os to the firmware. The driver also reduces the VD queue depth at storport when throttling occurs.

ID: DCSG01086216
Headline: MPI 3.0 (24): Header file changes associated with Revision 24 of the MPI 3.0 specification.
Description Of Change: Added all new definitions from proposals integrated in Revision 24.

ReleaseOrder ID: ***DCSG01092352*** Open In CQWeb
Headline: ***SAS4 : Windows Driver 8.01.06.00 Release Order.***
Release Version: ***8.01.06.00***
UCM Project: ***MPI3X_WINDOWS_DRIVER***
Sub UCM Project: ***MPI3X_WINDOWS_DRIVER_MR8.1***
UCM Stream: ***MPI3X_WINDOWS_DRIVER_MR8.1_Rel***
Release Type: ***Pre-Alpha-1***
State: ***Released***
Release Baseline: ***MPI3X_WINDOWS_DRIVER_MR8.1_Rel_2021-12-07@\SAS4***
Release Date: ***2021-12-07 21:21:27.000000***
Date Generated: ***Apr 29, 2022***

Defects Fixed (2):

ID: DCSG01091075
Headline: AV1: BSOD- D1- DRIVER_IRQL_NOT_LESS_THAN_EQUAL
Description Of Change: When HBA FW IOCTL is failed back, clear the active IOCTL flag
Issue Description: HBA FW IOCTL fails with invalid IOCTL Signature as expected. We dont clear the flag of pended IOCTL clearly which leads to IOCTL timeout and double completion of an IOCTL. This leads to crash
Steps To Reproduce: This issue seen on WS 2022 on Dell R7515
OS installed on System pd.
Upgrade the driver to 8.1 - 8.01.05.00
Reboot the system. During boot system hit with BSOD - DRIVER_IRQL_NOT_LESS_THAN_EQUAL- D1

ID: DCSG01091109
Headline: Av1 B0: Windows BlueScreens when creating R5, TC DCSG00627380
Description Of Change: When HBA FW IOCTL is failed back, make sure the ActiveIOCTL flag is also cleared.
Issue Description: When HBA FW download IOCTL fails signature check, IOCTL is returned back to application, but the activeIOCTL flag is not cleared. This causes the IOCTL timer to initiate and when it timesout, driver stars the SoftReset process.. When we try to clear all pended IO, driver tries to access this IOCTL which has already been returned. This causes driver to hit NULL check and crash the system
Steps To Reproduce: With the latest driver and 9.25 FW while it seemed to be creating R5, TestCase DCSG00627380.

ReleaseOrder ID: ***DCSG01090780*** Open In CQWeb
Headline: ***SAS4 : Windows Driver 8.01.05.00 Release Order.***
Release Version: ***8.01.05.00***
UCM Project: ***MPI3X_WINDOWS_DRIVER***
Sub UCM Project: ***MPI3X_WINDOWS_DRIVER_MR8.1***
UCM Stream: ***MPI3X_WINDOWS_DRIVER_MR8.1_Rel***
Release Type: ***Pre-Alpha-1***
State: ***Released***
Release Baseline: ***MPI3X_WINDOWS_DRIVER_MR8.1_Rel_2021-12-02@\SAS4***
Release Date: ***2021-12-02 22:28:34.000000***
Date Generated: ***Apr 29, 2022***

Defects Fixed (2):

ID: DCSG01087352
Headline: AV1_81: INIT Failed: FAILED TO GET FIXED MEMORY result to hibernation failure.
Description Of Change: Trigger and host diag buffer functionality disabled in dump mode
Issue Description: The issue was caused by the large size buffer allocation done for supporting trigger functionality which was also enabled in the dump mode.
Steps To Reproduce: 1) Installed the latest driver 8.01.03.00.
2) Performed the hibernation via sleep tool.
3) During hibernation - windbg logs reported failure -- mpi3drv(23): INIT Failed: FAILED TO GET FIXED MEMORY. Which result in hibernation failure

ID: DCSG01087558
Headline: Av1 B0: VDBench the mount point mounting fails after VD import
Description Of Change: If rescan is scheduled, dont disable it when we get back to back UnHide event
Issue Description: When back to back UnHide event is received, 1st sets the Rescan and 2nd disables the rescan.. Since rescan is disabled, causing the device to not show up in device manager
Steps To Reproduce: TestRun DCSG01082536 Run heavy IO on VDs with Pinned Cache and Write Journals present on the controller
During Step 7 the mount point mounting fails

Enhancements Implemented (2):

ID: DCSG00109045
Headline: Add support to Windows Ventura IT driver for the generic Windows HBA firmware upload IOCTLs
Description Of Change: Added HbaFirmware.c and HbaFirmware.h files containing support for the generic OS HBA FW download IOCTLs.
HBA FW State machine has been implemented for Avenger so that it can send an ComponentImage via MPI3 Request to the Firmware.
FW Activate request is also sent via MPI3_CI_DOWNLOAD_REQUEST with action set as Activate.

ID: DCSG01072280
Headline: SAS4: Windows driver: Handle DeviceMissingDelay in Drivers.
Description Of Change: DMD (device missing delay) causes the device to be not responsive for that time period.. To support this, driver needs to block access to the device by pausing the IOs on getting Delay_Not_Responding event, and resume when it get _Responding event

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ReleaseOrder ID: ***DCSG01084262*** Open In CQWeb
Headline: ***SAS4 : Windows Driver 8.01.03.00 Release Order.***
Release Version: ***8.01.03.00***
UCM Project: ***MPI3X_WINDOWS_DRIVER***
Sub UCM Project: ***MPI3X_WINDOWS_DRIVER_MR8.1***
UCM Stream: ***MPI3X_WINDOWS_DRIVER_MR8.1_Rel***
Release Type: ***Pre-Alpha-1***
State: ***Released***
Release Baseline: ***MPI3X_WINDOWS_DRIVER_MR8.1_Rel_2021-11-19@\SAS4***
Release Date: ***2021-11-20 22:36:02.000000***
Date Generated: ***Apr 29, 2022***

Defects Fixed (1):

ID: DCSG01084080
Headline: Av1 B0: When 8.01.02 driver is loaded Hard Secure controller is not seen
Description Of Change: Changes incorporated to correctly handle Controller secure mode
Issue Description: Hard secure devices were incorrectly identified as invalid devices
Steps To Reproduce: Load the driver in the system with a hard secure controller connected and observe the driver not detecting the controller

---

ReleaseOrder ID: ***DCSG01083654*** Open In CQWeb
Headline: ***SAS4 : Windows Driver 8.01.02.00 Release Order.***
Release Version: ***8.01.02.00***
UCM Project: ***MPI3X_WINDOWS_DRIVER***
Sub UCM Project: ***MPI3X_WINDOWS_DRIVER_MR8.1***
UCM Stream: ***MPI3X_WINDOWS_DRIVER_MR8.1_Rel***
Release Type: ***Pre-Alpha-1***
State: ***Released***
Release Baseline: ***MPI3X_WINDOWS_DRIVER_MR8.1_Rel_2021-11-18@\SAS4***
Release Date: ***2021-11-20 00:00:00.000000***
Date Generated: ***Apr 29, 2022***

Enhancements Implemented (4):

ID: DCSG01012181
Headline: Trigger implementation for Host Diag Buffer
Description Of Change: Changes are made to support Triggers for host diagnostic buffers

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ID: DCSG01044631
Headline: Issue Diag Fault Reset when MPI3_EVENT_PREPARE_RESET_RC_START timesouts.
Description Of Change: When MPI3_EVENT_PREPARE_RESET_RC_START time out, current driver was issuing SoftReset. With the current approach, the Snap dump will not be triggered in FW. Since this is an condition in FW, to capture snap dump, With this new ER driver issue DaigFault has been before SoftReset to allow FW to collect the SnapDump. This will help us to understand the cause of timeout of the event.

ID: DCSG01046311
Headline: Run Coverity static checker and fix any issues found
Description Of Change: Fixed issues reported by coverity static checker

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ID: DCSG01074681
Headline: Product Name change H965 to H965i
Description Of Change: Product Name change H965 to H965i

ReleaseOrder ID: ***DCSG01063898*** Open In CQWeb
Headline: ***SAS4 : Windows Driver 8.01.01.00 Release Order.***
Release Version: ***8.01.01.00***
UCM Project: ***MPI3X_WINDOWS_DRIVER***
Sub UCM Project: ***MPI3X_WINDOWS_DRIVER_MR8.1***
UCM Stream: ***MPI3X_WINDOWS_DRIVER_MR8.1_Rel***
Release Type: ***Pre-Alpha-1***
State: ***Released***
Release Baseline: ***MPI3X_WINDOWS_DRIVER_MR8.1_Rel_2021-10-18@\SAS4***
Release Date: ***2021-10-18 22:32:13.000000***
Date Generated: ***Apr 29, 2022***

Defects Fixed (2):

ID: DCSG01051901
Headline: Host Diagnostic buffers retrieved are not proper
Description Of Change: Changes are made to notify the firmware about the buffer being released during soft reset
Issue Description: During a soft reset, buffers are marked released however firmware was not notified
Steps To Reproduce: 1) Retrieve host diagnostic buffer (FW and trace) using the scrutiny upload command
2) Decode the retrieved buffer, it cant not be decoded.

ID: DCSG01056852
Headline: Windows Avenger Driver MPI3 Passthru IOCTL does not set ReturnCode
Description Of Change: set the default status for all IOCTLs at the start of the IOCTL processing
Issue Description: driver was setting the default status for Driver handled IOCTL, but not for passthru IOCTL
Steps To Reproduce: Using SAL_Avenger, the latest FW and driver version in Windows 2016 STD, issue any of the MPI3 Passthrough Messages to the adapter. In my case, I was issuing the IOC Facts Request and Get Config Page requests.

ReleaseOrder ID: ***DCSG01053876*** Open In CQWeb

Headline: ***SAS4 : Windows Driver 8.01.00.00 Release Order.***
Release Version: ***8.01.00.00***
UCM Project: ***MPI3X_WINDOWS_DRIVER***
Sub UCM Project: ***MPI3X_WINDOWS_DRIVER_MR8.1***
UCM Stream: ***MPI3X_WINDOWS_DRIVER_MR8.1_Rel***
Release Type: ***Pre-Alpha-1***
State: ***Released***
Release Baseline: ***MPI3X_WINDOWS_DRIVER_MR8.1_Rel_2021-10-04@\SAS4***
Release Date: ***2021-10-04 09:06:38.000000***
Date Generated: ***Apr 29, 2022***

Defects Fixed (1):

ID: DCSG01038591
Headline: AV1: RttDump - FW version is not populated.
Description Of Change: Switched Rttrace in the driver to pull FW version from the FWVersion field of AdapProp instead of the MpiVersion as was done prior to Avenger. Then reimplemented the format procedure to conform to the new Avenger format for HBA FW Version.
Issue Description: Download the Rttdump for AV1 controller..
FW version is not populated at the Rttdump

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Broadcom Windows Driver Real-Time Trace Utility (RttCli - Meta Data Driven)
Version 5.1.0.0, Built Jul  8 2021 13:30:28

Command = Display, Filename (In) = mpi3drv.sys_8.00.07.01_c0_2021_09_14_20_03_37.rtt, Format = BRIEF, Number Size = DWORD

Parsing MetaData File...
Opening File 'MPI3DRV.RTTMETA'
END OF FILE, 434 Records Processed

Build times match between RTT and MetaaData files

Real-Time trace Buffer Dump (Header)
------------------------------------
Port Number           : 0
Rttrace Version       : 3.0
Driver Name           : mpi3drv.sys
Driver Version        : 8.00.07.01
Firmware Version      : Not Available
Upload Time           : 09//15//2021 01:33:37.000
Buffer Size           : 204800
Number Events         : 3406
Trace State           : Enabled
First Record Offset   : 0x00000000
Last Record Offset    : 0x00001284

----------------------------------------------------------------------

RTTCLI version -
```

Steps To Reproduce:

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--------------------------------------------------------------
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```

Enhancements Implemented (7):

ID: DCSG01005486
Headline: MPI 3.0: Create RevV interim header release
Description Of Change: Add following proposals to headers in advance of full TechPubs release:
DCSG00973445: Restrict SPDM cert slot programming
DCSG00982494: GPIO Update

ID: DCSG01022737
Headline: Header file changes associated with Revision 23 of the MPI 3.0 specification.
Description Of Change: Added changes from proposals and review to headers and doc

ID: DCSG01036277
Headline: Reading Driver Page 1 for Host Diag Buffer
Description Of Change: Read driver page1 and obtain MIN, MAX, and DECREMENT size of FW and TRACE buffers. These values are used to register the buffer with the driver.

ID: DCSG01044838
Headline: SAS4: Windows Driver: Update to MPI 3.0 Version 3.00.23.00
Description Of Change: Update MPI headers to version 23 and remove the deprecated temperature threshold event from the driver.

ID: DCSG01048943
Headline: SAS4: Windows Driver: Add OEM PNP IDs
Description Of Change: Intel re-branding Broadcom "9600-24i" as "Intel(R) RAID Controller RSP4QG240J"
PnP ID for Windows driver:
Vendor ID: 0x1000
Device ID: 0x00A5
SubVendorID: 0x8086
SubDeviceID: 0x4660

ID: DCSG01049504
Headline: SL8: Host OCR and Fault Handling behavior, Adapter conditions (driver/SL8)
Description Of Change: The driver is enhanced to return the current state of the controller (Operational, In Reset, Fault, Unrecoverable) as part of the information returned for Adapter Information IOCTL.;

ID: DCSG01051916
Headline: Cleanup Obsolete Rttrace Events throughout Avenger Driver
Description Of Change: Many obsolete Rttrace events within the Avenger driver which were carried over from the Ventura driver are no longer needed and were removed to make it easier to maintain the Avenger driver gong forward.