BROADCOM® Release Notes: GCA Release: CtrlFw_Ph_20.0 - 20.00.00.00 Firmware

ReleaseOrder ID:	**DCSG00999716**
Headline:	**GCA Release: CtrlFw_Ph_20.0 - 20.00.00.00 Firmware**
Release Version:	**20.00.00.00**
UCM Project:	**CtrlFw**
Sub UCM Project:	**CtrlFw_Ph_20.0**
UCM Stream:	**CtrlFw_Ph_20.0_Rel**
Release Type:	**GCA**
State:	**Released**
Release Baseline:	**CtrlFw_Ph_20.0-2021-07-13-20.00.00.00_REL_1626183390@\SAS35**
Release Date:	**2021-07-13 13:30:40.000000**
Date Generated:	**Jul 16, 2021**

Release History

- **DCSG00990240 - ReleaseCandidate Release: CtrlFw_Ph_20.0 - 19.250.10.00 Firmware**
- **DCSG00987576 - Beta Release: CtrlFw_Ph_20.0 - 19.250.09.00 Firmware**
- **DCSG00983028 - Alpha Release: CtrlFw_Ph_20.0 - 19.250.08.00 Firmware**
- **DCSG00975827 - Alpha Release: CtrlFw_Ph_20.0 - 19.250.07.00 Firmware Release**
- **DCSG00975195 - Pre-Alpha Release: CtrlFw_Ph_20.0 - 19.250.06.00 Firmware Release**
- **DCSG00971334 - Pre-Alpha Release: CtrlFw_Ph_20.0 - 19.250.05.00 Firmware**
- **DCSG00966556 - Pre-Alpha Release: CtrlFw_Ph_20.0 - 19.250.04.00 Firmware**
- **DCSG00957386 - Pre-Alpha Release: CtrlFw_Ph_20.0 - 19.250.03.00 Firmware**
- **DCSG00950833 - Pre-Alpha Release: CtrlFw_Ph_20.0 - 19.250.02.00 Firmware**
- **DCSG00941674 - Pre-Alpha Release: CtrlFw_Ph_20.0 - 19.250.01.00 Firmware**

ReleaseOrder ID:	**DCSG00990240** Open In CQWeb
Headline:	**ReleaseCandidate Release: CtrlFw_Ph_20.0 - 19.250.10.00 Firmware**
Release Version:	**19.250.10.00**
UCM Project:	**CtrlFw**
Sub UCM Project:	**CtrlFw_Ph_20.0**
UCM Stream:	**CtrlFw_Ph_20.0_Rel**
Release Type:	**ReleaseCandidate**
State:	**Released**
Release Baseline:	**CtrlFw_Ph_20.0-2021-06-28-19.250.10.00_REL_1624880105@\SAS35**
Release Date:	**2021-06-28 11:34:26.000000**
Date Generated:	**Jul 16, 2021**

Defects Fixed (1):

ID:	DCSG00984451
Headline:	Blue Screens while collecting "pl dbg" logs
Description Of Change:	Summary release notes updated to explain the behavior
Issue Description:	'pl dbg' command takes about 5-6 minutes to complete. it is recommended not to send any firmware handled command during debug data log collection. This may lead to timeouts and result in OS crash or controller hang.
Steps To Reproduce:	Collect pl dbg and observe OS crash.

Enhancements Implemented (1):

ID:	DCSG00979878
Headline:	Update SAS 3.5 FW summary release notes
Description Of Change:	Firmware Image header is wrongly populated the versionName filed with build type , build date and time instead of firmware version.

ReleaseOrder ID:	**DCSG00987576** Open In CQWeb
Headline:	**Beta Release: CtrlFw_Ph_20.0 - 19.250.09.00 Firmware**
Release Version:	**19.250.09.00**
UCM Project:	**CtrlFw**
Sub UCM Project:	**CtrlFw_Ph_20.0**
UCM Stream:	**CtrlFw_Ph_20.0_Rel**
Release Type:	**Beta**
State:	**Released**
Release Baseline:	**CtrlFw_Ph_20.0-2021-06-22-19.250.09.00_REL_1624363420@\SAS35**
Release Date:	**2021-06-22 12:03:03.000000**
Date Generated:	**Jul 16, 2021**

Defects Fixed (2):

ID:	DCSG00975065
Headline:	UBM statistics data collection and UBM error handling fixes
Description Of Change:	Fixes for UBM statistics data collection issues and error handling issues observed during UBM emulator error injection unit testing.
Issue Description:	Observations during Elrond UBM error emulator - HBA unit testing.
Steps To Reproduce:	NA

ID:	DCSG00981706
Headline:	Performance drop seen with SAS/SATA drives in Windows using latest driver
Description Of Change:	SAS IO Unit Page 1 and PCIe IO Unit Page 1 in nvdata defaults changed to use recommended values of SAS, SATA and NVMe max queue depth values.
Issue Description:	In a recent windows driver change, the drive queue depth values are set using the values read from SAS IO Unit Page 1 from firmware NVDATA instead of using the default values. This resulted in performance drop since the NVDATA values were not same as recommended values from performance team.
Steps To Reproduce:	In Windows OS with latest driver run performance test with sequential write at high queue depth value on a controller with SAS or SATA HDDs.

ReleaseOrder ID:	**DCSG00983028** Open In CQWeb
Headline:	**Alpha Release: CtrlFw_Ph_20.0 - 19.250.08.00 Firmware**
Release Version:	**19.250.08.00**
UCM Project:	**CtrlFw**
Sub UCM Project:	**CtrlFw_Ph_20.0**
UCM Stream:	**CtrlFw_Ph_20.0_Rel**
Release Type:	**Alpha**

Defects Fixed (3):

ID: DCSG00980873
Headline: Performance drop seen with direct attached SAS/SATA drives
Description Of Change: DMA port limit change during port configuration is done only for wide ports.
Issue Description: In a recent defect, it was observed that during initial discovery only two of the expander phys were linking up so the dma limit of the port was set to 2. Later the other two phys also linked up but dma limit of the port was not changed, this lead to performance drop for expander attached devices. To fix this dma limit of the ports were set every time port configuration changes, however this changed the dma limit of direct attached devices as well. Since all the direct attached devices are clubbed into single port it is not desired to change the dma limit of direct attached devices.
Steps To Reproduce: Directly attach SAS or SATA HDDs to all phys of the controller and run sequential write IO. Performance drop is observed.

ID: DCSG00982343
Headline: Coverity : Remove dead code
Description Of Change: Removed dead code
Issue Description: Dead code was found in coverity analysis
Steps To Reproduce: Not applicable

ID: DCSG00982364
Headline: Update SSUTimeout Fields Value in BIOS Page 1 to 0xF0
Description Of Change: Modified NVData and updated the SSUTimeout Fields Value in BIOS Page 1 to 0xF0
Issue Description: Current value of SSUTimeout Field in BIOS Page 1 is 0x1E and it has been determined that BIOS hits timeout on SSU command with this value.
Steps To Reproduce: 1. Connect multiple drives with High Spin up time behind an internal controller.
2. Execute system Reboot test in loop and observe drives not getting detected by the UEFI BSD.

Enhancements Implemented (2):

ID: DCSG00949306
Headline: SNTL Code coverage Improvement
Description Of Change: Add various non read write SCSI commands in NVMe BST test script.

ID: DCSG00974796 (Port Of EnhancementRequest DCSG00966411)
Headline: Enhance Error scenario handling in SEKM Feature code
Description Of Change: Between VMWare driver registration of Host Message Event and completion of Port Enable initiated by the VMWare driver, there is a time window in which firmware is currently sending Host Message event when it receives a Send Host Message command from BMC. Firmware is now modified to not send Host Message Event in this window and reject the Send Host Message command coming from BMC during this time. Once Port enable initiated by the VMWare driver is complete, then firmware will send the Host Message event when it receives a Send Host Message command from BMC.

Defects Fixed (1):

ID: DCSG00973316
Headline: VSES : Multiple elements of SES page 0xA are assigned the same slot number
Description Of Change: Corrected the logic to find the first phy of a DFC.
While updating SES page 0xA, this is used to set the invalid bit for all element descriptors beyond the first phy of the DFC,
if phy belongs to a DFC with link width more than 1.
Issue Description: In PCIe disabled configuration, when a UBM backplane is attached with DFCs that have link width more than 1 and all the connectors are not connected, then multiple element descriptors in SES page 0Ah have the same slot number.
Steps To Reproduce: 1. Attach drive to x4 UBM backplane
2. PCIe/NVMe is disabled.
3. P0 of Cable is connected and P1 is not connected.
4. When SES page 0xA is read, elements 0,1 and 3 are assigned with slot 0.

Defects Fixed (1):

ID: DCSG00967012
Headline: Hot add drive on UBM backplane with x2 or X4 DFC reports incorrect element status in SES Page 02h
Description Of Change: Modify the UBM state machine to not update SES Page 02h during hot plug and mark the existing SES page 02h data as stale.
Receivediagnostic command updates the SES page 02h with latest SES status code from UBM.
Issue Description: Hot add of drive is causing the UBM state machine to run and use the stale data to update the SES page 02h elements.
Elements which are invalid or not active are getting updated with wrong element status.
Steps To Reproduce: 1) Connect a SAS drive to UBM BP with x2 DFC.
2) Check the Element status in SES Page 02h at boot.
3) Perform a hot plug of the drive.
4) Observe that Element status in SES Page 02h is not consistent with step2.

Defects Fixed (2):

ID: DCSG00966202
Headline: Two elements of SES Page A are assigned same slot number for UBM backplanes with x2 DFC
Description Of Change: While filling the SES page 0Ah elements, check if phy belongs to a DFC with link width more than 1. Set the invalid bit for all element descriptors beyond the first phy of the DFC.
Issue Description: In PCIe disabled configuration, when a UBM backplane is attached with DFCs that have link width more than 1, element descriptors in SES page 0Ah for all phys of the DFC have the same slot number.
Steps To Reproduce: Attach a x2 UBM backplane to a controller where PCIe/NVMe is disabled.

ID: DCSG00966397
Headline: Update Version Field value in Std Inquiry Data of vSES Device
Description Of Change: Updated PL code to populate the Version field value in Std Inquiry Data of vSES device with SCSI_INQUIRY_VERSION_SCSI_3_SPC5 (0x07)
Issue Description: Version Field in Std Inquiry Data of vSES device is filled from Man Page 46, but if the Man Page 46 read fails, PL Code fills up static data. Currently the Version field is populated with SCSI_INQUIRY_VERSION_SCSI_3_SPC4 (0x06). This needs to be updated to SCSI_INQUIRY_VERSION_SCSI_3_SPC5 (0x07)
Steps To Reproduce: 1. Create Debug FW to fail the Man Page 46 config page read request while build inquiry data for vSES device
2. Send Inquiry command to vSES device

Defects Fixed (4):

ID: DCSG00957168
Headline: Drives not discovered when an enclosure is hot plugged after removing a PCIe switch based JBOF
Description Of Change: Increment the internal counter of SAS/SATA targets when the SES device of a managed switch is discovered.
Issue Description: The managed switch has a SES target, so a device handle is allocated for it from a pool of SAS/SATA devices. However an internal counter that counts the number of SAS/SATA targets is not incremented. When the switch is removed the counter is decremented making it 0 - 1 = 0xFFFF. Which is then more than the allocated number of SAS/SATA targets and any new drive added is not allocated a device handle.
Steps To Reproduce: 1. Attached a PCIe switch based JBOF
2. Remove the JBOF
3. Attach an enclosure with a few SAS/SATA devices.
The drives connected in step 3 are not discovered and discovery status of the port is set to Max devices exceeded.

ID: DCSG00934187 (Port Of Defect DCSG00927996)
Headline: Fixed fault 0xF000 when doing VSES task management
Description Of Change: Fixed code to resolve a deadlock situation in the code that was causing fault 0xF000 during Task Management to a VSES device for direct attach Elronds with NVME drives.
Issue Description: There was a small window where VSES LED slot status update is received followed by a TM while Change detect is being handled. TM being active causes the dead lock with Change detect handling to fail and start again recursively.
Steps To Reproduce: Run IO's and TMs on direct attach NVMe configuration.

ID: DCSG00964427 (Port Of Defect DCSG00947126)
Headline: SATA : one or more HDD are not discovered by OS when drives behind expander are powered ON
Description Of Change: Start the pended IOs if discovery is active due to SATA hinting.
Issue Description: The IOs to the SATA drive are pended if SATA initialization by PL is not complete.
The pended IOs are not started if discovery is active.
As the discovery is active and taking longer due to SATA hinting
(SATA hinting is a feature where PL waits longer to discover the SATA drives behind expander),
the Report LUN command issued by driver is timing out. Even the retries are timing out.
Hence driver drops the drive and the drive is not discovered by OS.
Steps To Reproduce: There are 36 SATA HDDs behind the expander.
1. Issue a sequence of sg commands to power off 36 HDDs
2. Wait at least 60 seconds for HDD status change (on->off)
3. check if 36 HDDs are removed
4. Issuing a sequence of sg commands to power on 36 HDDs
5. Wait at least 120 seconds for HDD status change (off->on)
6. check if 36 HDDs are present

ID: DCSG00956655 (Port Of Defect DCSG00952803)
Headline: MCTP : MCTP MPI requests are failed with drive missing status even when drive is present
Description Of Change: Corrected the condition check used for clearing the drive missing flag used by MCTP code.
Issue Description: Drive missing flag used by MCTP code is cleared if link rate indicates drive linkup.
Due to wrong condition check of link rate, the flag is not cleared leading to the flag being set even after drive comes back.
Steps To Reproduce: Reboot the server with a drive on which link goes down after coming up.
Later it links up again.
Note: Issue is seen with a particular drive.

Enhancements Implemented (3):

ID: DCSG00957868
Headline: Remove SASPARSER binary from Release Order
Description Of Change: Update the release build script to remove the SASPARSER binary from the release zip file.
Update README file to include the SASPARSER Release Order CQ ID to download the SASPARSER utility.

ID: DCSG00966344
Headline: Connector Order change for 9502-16e controller
Description Of Change: Connector Order is reversed for 9502-16e in mfg page 7 or partial NVDATA xml.

ID: DCSG00963253 (Port Of EnhancementRequest DCSG00962565)
Headline: Error handling of UBM CHANGE_DETECT# signal
Description Of Change: If an I2C error occurs after retries while servicing the Change Detect# interrupt signal, move to completion so that a Virtual SES LED management IO request waiting on it can be processed.
Handle LED management state machine for a Task Management due to a timed out Virtual SES LED management IO request.

ReleaseOrder ID:	*DCSG00957386* Open In CQWeb
Headline:	*Pre-Alpha Release: CtrlFw_Ph_20.0 - 19.250.03.00 Firmware*
Release Version:	*19.250.03.00*
UCM Project:	*CtrlFw*
Sub UCM Project:	*CtrlFw_Ph_20.0*
UCM Stream:	*CtrlFw_Ph_20.0_Rel*
Release Type:	*Pre-Alpha*
State:	*Released*
Release Baseline:	*CtrlFw_Ph_20.0-2021-04-29-19.250.03.00_REL_1619707884@ \SAS35*
Release Date:	*2021-04-29 14:50:42.000000*
Date Generated:	*Jul 16, 2021*

Defects Fixed (3):

ID: DCSG00950631
Headline: Imbalanced bandwidth performance with 2 x4 expanders connect to Aero IT controller
Description Of Change: Whenever port configuration changes for a phy, set the port limit of the dma port of that phy based on current port width of the port that phy is part of.
Issue Description: At the start of discovery, only two phys connected to the second expander are linked up. The dma port configuration is done only once at the start of discovery, so the port limit which sets the number of TxDMA a dma port can use is set to 2 based on initial port width. Later the other two phys also link up, but the port limit is not changed causing the performance to drop for the drives behind the second expander.
Steps To Reproduce: Attach two expanders with drives to Aero controller and perform IO performance test. Sometimes the performance to drives connected to one of the expander is lower than the drives on other expander.

ID: DCSG00951807
Headline: Critical Error Log created if the Firmware Download of BIOS using BIOS image from different package than Firmware.
Description Of Change: After the FW download completion while checking the IOC Status for any failure ignore the LogInfo available bit in the IOCStatus.
Issue Description: When the BIOS download is done using the BIOS image from a different package than the package version of current firmware, Firmware completes the fw download command with a specific Loginfo and the Loginfo available bit set in IOCStatus of the reply. At the end of firmware download command, firmware checks for any error in the IOCStatus and logs a critical flash error in case of error, this check was not masking the Loginfo available bit while comparing it with success status.
Steps To Reproduce: Send a Firmware download command to flash the BIOS image where the BIOS image is from a different package than the current firmware.

ID: DCSG00957157
Headline: BST: invalid syntax for Uart config
Description Of Change:
Corrected syntax for UART config in scripts.
Issue Description:
Python threw exception for syntax error.
Steps To Reproduce:
Run BST scripts.

Enhancements Implemented (6):

ID: DCSG00019759
Headline: BST: Add locate PD test cases to UBM BST
Description Of Change: Added test cases to validate LED locate start/stop operations.

ID: DCSG00776916
Headline: [OEM][BST] Add a new OEM server to BST
Description Of Change: Add the uart details and enclosure details to BST scripts

ID: DCSG00776933
Headline: Add support for FW UART console to BST scripts
Description Of Change:
BST scripts shall be able to access UART console on adapter card directly, and be able to send and receive FW CLI commands and their response.

ID: DCSG00777063
Headline: Add cable breaker support to BLR test Hosts
Description Of Change:
Added cable breakers to all BLR test hosts.

ID: DCSG00903198
Headline: UBM error handling improvements and debug statistics data collection
Description Of Change: This ER implements the following
    - Enhance error detection and reporting
    - Graceful handling of invalid config or misbehaving UBM backplanes
    - Capture debug statistics data and report through Uart cli cmd
    - Report UBM anomalies and spec non-compliances through Uart cli cmd

ID: DCSG00945423
Headline: [UBM] Add detection of SAS/SATA drive with UBM backplane supporting IFDET2# and PRSNT#
Description Of Change: Add device type installed check for SAS/SATA drive for UBM backplane which supports IFDET2# and PRSNT# signal reporting and IFDET# signal is not supported in its capabilities.

ReleaseOrder ID:	*DCSG00950833* Open In CQWeb
Headline:	*Pre-Alpha Release: CtrlFw_Ph_20.0 - 19.250.02.00 Firmware*
Release Version:	*19.250.02.00*
UCM Project:	*CtrlFw*
Sub UCM Project:	*CtrlFw_Ph_20.0*
UCM Stream:	*CtrlFw_Ph_20.0_Rel*
Release Type:	*Pre-Alpha*
State:	*Released*
Release Baseline:	*CtrlFw_Ph_20.0-2021-04-19-19.250.02.00_REL_1618837927@ \SAS35*
Release Date:	*2021-04-19 13:11:36.000000*
Date Generated:	*Jul 16, 2021*

Defects Fixed (1):

ID: DCSG00947866 (Port Of Defect DCSG00939163)
Headline: Fault 0xEE19 observed while running lane break test with managed switch attached to controller.
Description Of Change: Skip entering MPI device state machine when the device is missing.
Issue Description: At some point in test a read to some register fails, so a reset is issued to the Switch MPI device. After reset during discovery switch MPI device is found to be missing. Then again read to PCI register fails, at this time when MPI driver tries to issue a reset it faults since MPI device state machine could not be moved to proper state as the device was missing.
Steps To Reproduce: Run lane break test using cable breaker between controller and managed PCIe switch with some NVMe drives attached.

Enhancements Implemented (3):

ID: DCSG00779724

Headline: PL SATA : Read logpage 12 and 13 during SATA initialization to get features supported for NCQ encapsulation using FIS porting

Description Of Change: If supported, read log page 12 NCQ non data log
1. store if NCQ non data Zero Ext supported or not
2. store if NCQ non data ZAC management out is supported

If supported, read log page 13 NCQ send/recieve log
1. store if NCQ send fpdma queued supports Data Set Management
2. store if NCQ send fpdma queued supports Data Set Management with TRIM bit
3. store if NCQ send fpdma queued supports Write Log Ext

ID: DCSG00927210

Headline: PL SATL : Add SAT translation for the Concurrent Positioning Ranges VPD page

Description Of Change: Upon Concurrent Positioning VPD page(0xB9) request in inquiry ,
send READ LOG EXT command with Log address set to 0x47 in order to
read Concurrent Positioning Ranges log from the drive.
Form the Concurrent Positioning VPD pag based on the data obtained from the drive
and send it to host.

Reference:
ACS 5 - Revision 10, section 9.31
SAT 5 - Revision 5, section 10.5.13

ID: DCSG00950531

Headline: Release Automation: automate rebase operation for phase specific streams

Description Of Change:

Automated rebase operations for phase specific streams.

ReleaseOrder ID:	*DCSG00941674* Open In CQWeb
Headline:	*Pre-Alpha Release: CtrlFw_Ph_20.0 - 19.250.01.00 Firmware*
Release Version:	*19.250.01.00*
UCM Project:	*CtrlFw*
Sub UCM Project:	*CtrlFw_Ph_20.0*
UCM Stream:	*CtrlFw_Ph_20.0_Rel*
Release Type:	*Pre-Alpha*
State:	*Released*
Release Baseline:	*CtrlFw_Ph_20.0-2021-04-06-19.250.01.00_REL_1617713858@ \SAS35*
Release Date:	*2021-04-06 12:56:43.000000*
Date Generated:	*Jul 16, 2021*

Defects Fixed (1):

ID: DCSG00937617

Headline: Unsupported MPI Config page read from OOB provides data in response

Description Of Change: Added a check in FW to verify the Config Page request was successfully processed before appending the data to the response.

Issue Description: As part of the config page response, FW is not checking if the Config Page request was successfully processed or not before appending the data.

Steps To Reproduce: Read any unsupported MPI Config page read from OOB

Enhancements Implemented (3):

ID: DCSG00927207

Headline: [Aero] Enable UBM detection logic on all connectors for OEM HBA with SEP_PRESENT GPIOs

Description Of Change: 1) SEP present GPIO is pulled high by default on certain OEM HBA - Backplane configurations.
2) Need to walk through all connectors to see if any connector is connected to UBM.
3) Discover the UBM if any of connector is plugged to UBM Backplane.

ID: DCSG00927212

Headline: SAS phy port configuration of UBM connected phys based on UBM DFC Link width.

Description Of Change: 1. Modify current copy of SAS IO Unit page 1 based on UBM configuration (if DFC link width is more than 1).
   - All phys connected to same DFC to be in same port.
   - All phys connected to same DFC will have auto port config turned off.
2. Modify Link reset state machine to not call link up discovery, till the first phy of a DFC links up.
3. During port configuration, check all phys of a manual config port to see if SAS address of all phys is same or not. If SAS address is different from the first phy of the DFC, then set a flag in controller phy data structure indicating 'Invalid SAS address'.
4. During direct attached device discovery, ignore phys with 'Invalid SAS address' flag set.
5. In case of SAS IO unit page 0 read for phy with 'Invalid SAS address' flag set, the DiscoveryStatus field will have bit 2 set (Un-Addressable device) and Negotiated Link rate will be set to 0 (Unknown).

ID: DCSG00927213

Headline: Support streaming of debug logs (HTB) via I2C OOB band on Ventura/Aero IOC/HBA (Part B)

Description Of Change: Updated the ManPage19 Flags field in the XSD to set the "HTB-Capture over MCTP OOB" bit to 1.