

Release Notes

Microsemi Adaptec Host Bus Adapter 1000 Series

Released

Issue 10: June 2017



Revision History

Issue	Issue Date	Details of Change
10	June 2017	Updated for 1.4 maintenance release.
9	January 2017	Updated for maintenance release.
8	November 2016	Updated for November maintenance release.
7	September 2016	Updated for 9/15 maintenance release.
6	April 2016	Updated for maintenance release.
5	December 2015	Updated for production release.
4	November 2015	Update for pre-production release.
3	September 2015	Update for pre-production release.
2	August 2015	Update for pre-production release.
1	August 2015	Document created.

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1 About This Release

This document describes the production release package of supported firmware, OS drivers, and host management software files for Microsemi® Adaptec® HBA 1000 Series products: 1000-16i, 1000-16e, 1000-8i8e, 1000-8i, 1000-8e.

Note: All Microsemi Adaptec products are UL listed and for use only with UL listed ITE.

1.1 Release Identification

The firmware, software, and driver versions for this maintenance release are shown in [Table 1 • Release Summary](#).

Table 1 • Release Summary

Package Release Date	May 30, 2017
Firmware Version	3.02 build 0 (basecode 05.01.026.000) ¹
Microsemi Adaptec Controller Configuration Utilities (ARCCONF Command Line Interface, maxView Storage Manager, maxView vSphere Plugin, Boot USB, Event-Monitor)	2.04.22665
Drivers Package Version	B54013 [Windows] B54013 [Linux and XenServer] B54013 [VMware]

1.2 Release Components

Download the following firmware, drivers, host management software, and supporting documentation for your HBA 1000 Series product from the Microsemi Adaptec Web site at start.adaptec.com.

1.2.1 Firmware and UEFI/HII and Legacy (CTRL-A) BIOS

This release supports version 2.50 build 0 of the HBA 1000 firmware, version 1.2.3.1202 of the Microsemi Adaptec UEFI/HII, and version 1.2.3.1206 of the Legacy (CTRL-A) BIOS utilities.

1.2.2 Drivers

Drivers for this release have been tested and certified on the following operating systems. You can load the drivers on out-of-box operating system versions, the latest service pack, or software updates. Compatibility issues may be seen with untested OS versions.

Microsoft Windows

- Microsoft Windows Server 2016
- Microsoft Windows Server 2012 R2, 2008 R2 SP1 (64-bit)
- Microsoft Windows 10, 8.1, 8, 7 (64-bit)

Linux:

- Red Hat Enterprise Linux/CentOS 7.3, 7.2 (64-bit)
- Red Hat Enterprise Linux/CentOS 6.8, 6.7 (64-bit)
- Red Hat Enterprise Linux/CentOS 6.6, 6.5, 6.4 (64-bit)¹
- SuSE Linux Enterprise Server 12 SP2, SP1 (64-bit)
- SuSE Linux Enterprise Server 11 SP4, SP3 (64-bit)
- Ubuntu Linux 16.04.01
- Ubuntu Linux 14.04.5 (64-bit)
- Oracle Enterprise Linux 7.2²
- Oracle Enterprise Linux 6.8²

Note:

1. Additional driver binaries are provided in the release package, but are provided as-is without support.
2. Default kernel not supported.

Citrix

- Citrix XenServer 7.0 (64-bit)

Virtual OS Environments

- VMware ESXi 6.5/6.0 U2 (64-bit)

1.2.3 Host Management Software

This release of the HBA 1000 Series provides Microsemi Adaptec Controller Configuration Utilities for host management, which include the following:

- Microsemi Adaptec ARCCONF Command Line Utility
 - Windows (64-bit)
 - Linux (64-bit)
 - VMware EXSi 6.5 and 6.0 (64-bit)

- XenServer 7.0 (64-bit)
- Microsemi Adaptec maxView Storage Manager
 - Windows (64-bit)
 - Linux (64-bit)
 - VMware EXSi 6.5 and 6.0 (64-bit)
 - XenServer 7.0 (64-bit)
- Microsemi Adaptec maxView vSphere Plugin
 - vCenter 6.5 and 6.0
- Boot USB (offline or pre-boot) for the ARCCONF command line utility and maxView Storage Manager
 - Linux (64-bit)
- Virtual OS Environments
 - Citrix XenServer 7.0 (64-bit)
 - Microsoft Hyper-V (64-bit)

Note:

Hyper-V runs as a service on the Windows host OS and does not require a separate driver.

Refer to the *README: maxView Storage Manager and ARCCONF Command Line Utility* for specific OS support details, installation notes, and known issues.

1.2.4 Supporting Documents

Refer to the Microsemi Adaptec Web site at start.adaptec.com for the latest product documentation for your HBA 1000 Series product.

PDF

- *Host Bus Adapter 1000 Series Installation and User's Guide*, PMC-2152188.
- *Host Bus Adapter 1000 Series Command Line Utility User's Guide*, PMC-2152156.
- *maxView Storage Manager User's Guide for Microsemi Adaptec Smart-Family Controllers*, PMC-2153109.
- *README: maxView Storage Manager and ARCCONF Command Line Utility*, PMC-2153191.
- *Host Bus Adapter 1000 Series Release Notes (This Document)*, PMC-2152169.

HTML

- *maxView Storage Manager Online Help*

2 What is New?

2.1 Features

[Table 2 • Feature Summary](#) lists features supported for this release. Features new to this release are designated as "New".

Table 2 • Feature Summary

Feature		Supported in this Release	Future Release
Software Features			
Support for up to 256 ¹ SAS/SATA target devices		X	
Multi-LUN support		X	
SATA NCQ HDD		X	
Storage space support	Expander attach	X	
Persistent binding	SCSI ID of a device/LUN remains the same after reboot - No addition or removal of devices	X	
Hot Plug drive support		X	
Backplane port/box/bay support with no backplane management		X	
SATA drive/SSD support		X	
HDD/SSD Work Load logging			X
SSD Wear Gauge			X
>2 TB physical drives		X	
S.M.A.R.T.		X	
SAS Drive/SSD support		X	
SAS expander support	Expose enclosure to host	X	
	SMP pass through to expander	X	
External storage 6G/12G		X	
External Array Connect		X	
Managed Cables		X	
Clustering/HA support for SAS devices (Windows and Linux)			X
Tape Support			
Internal Tape 3 GB SAS LTO3/4 I		X	
Internal Tape 6 GB SAS LTO5/6		X	

Feature		Supported in this Release	Future Release
External Tape 3 GB Multi-LUN, Tape Library		X	
External Tape 6 GB Multi-LUN, Tape Library		X	
Flashing			
Recovery NOR Flash ROM image		X	
Offline controller firmware flash		X	
Online controller firmware flash with reboot		X	
Offline drive firmware flash		X	
Online drive firmware flash with reboot		X	
Tape drive flashing		X	
Logging			
Device and array error logs		X	
Detailed controller log through serial port		X	
Detailed controller log through log files		X	
BMC Support			
BMC DST mechanism consistent with Series 8		X	
Enclosure Management			
SES-2		X	
SES-3		X	
SGPIO (SFF-8485)		X	
IBPI (SFF-8489)		X	
Management Utilities			
Microsemi Adaptec UEFI/HII BIOS Configuration Utility	>2.2 TB boot	X	
	UEFI boot from legacy device	X	
	UEFI boot from raw device (HBA device)	X	
	HII GUI (config support)	X	
	Secure boot	X	
Microsemi Adaptec Legacy BIOS Configuration Utility ²	Legacy BIOS boot from legacy device	X	
	Legacy BIOS boot from raw device (HBA device)	X	
	Legacy configuration at boot (CTRL-A)	X	

Feature		Supported in this Release	Future Release
Microsemi Adaptec Controller Configuration Utilities	ARCCONF Command Line Interface (Windows, Linux, VMware)	X	
	maxView Storage Manager	X	
	Boot USB	X	

Note:

1. 238 SSD/HDDs maximum support and remainder are reserved for expanders and enclosure management.
2. Only UEFI systems can boot from a 4K sector drive. The legacy CTRL-A controller BIOS displays all 4K and 512 byte drives connected to the controller during POST and there is CTRL-A support (like Format and Verify) for both 4K- and 512-byte drives, but INT 13 support for booting is available for 512-byte drives only.

2.2 Fixes

2.2.1 Firmware Fixes

2.2.1.1 Fixes and Enhancements for Firmware Release 3.02 Build 0

This release provides the following fixes and enhancements:

- Fixed an issue where the user was unable to select a boot device if a secondary boot device was already selected.
 - *Root cause:* Memory corruption.
 - *Fix:* Freed up unused code
 - *Risk:* Low
- The Locate LED behavior has been changed in this 3.02 firmware release. Previously, when the Locate LED is enabled, if a drive is removed and replaced the Locate LED will remain enabled and require the SSA/Arcconf/maxView tools to be used to disable the LED. In this release, when the Locate LED is enabled, if a drive is removed and replaced the firmware will automatically disable the Locate LED so the host tools will not be required.
- Fixed an issue where the tape backup was not working.
 - *Root cause:* A few fields in the firmware response structure to the driver were not set correctly.
 - *Fix:* The firmware will correctly set the auto sense valid field and response structure size field so that the host driver can pass the SCSI sense data buffer to the OS/tape application.
 - *Risk:* Low
- Fixed an issue where the Host BMC command timed out (set/clear boot drive).
 - *Root cause:* When writing the SEEPROM, interrupts are disabled. If a large block of data is written, other I2C interrupts may not get processed and cause timeouts.
 - *Fix:* The SEEPROM will now be written in smaller blocks so that I2C interrupts are not disabled for long periods of time and command timeouts do not occur.
 - *Risk:* Low
- Enabled IOBypass as the default option to preboot (BIOS/UEFI) utilities.
- Fixed an issue with the external HDD Status LED during and after a sanitize operation.
- Fixed expander off-by-one LEDs in dual domain configuration.
 - *Root cause:* For a given enclosure, we check all paths using both IO modules and their associated expanders. During these checks, we re-initialize some of the values. If good values for element index and eiioe bit were found on the first pass, on the second pass we were reinitializing over the good first values. If the second pass doesn't contain data, then they will not be updated with valid data.
 - *Fix:* Only re-initialize values once for any number of loops.
 - *Risk:* Low

2.2.1.2 Fixes and Enhancements for Firmware Release 2.56 Build 0

This release provides the following fixes and enhancements:

- Fixed an issue where after certain JBODs were reset, the controller firmware was not able to correctly identify the device bay numbers during SMP discovery.
 - *Root cause:* The controller firmware was not able to obtain the device bay numbers during initial part of the discovery, as some of the attributes were not available to calculate the bay numbers correctly.
 - *Fix:* Changed the controller firmware to populate the device bay numbers when the other attributes needed for calculating the bay number are available later in the discovery process.

- Fixed an issue where the SES discovery code was resetting the content of the SES elements when the controller was reset, thus resulting in drive bays being powered on.
 - *Root cause:* The firmware was resetting all the SES page 0x2 array element control bits during controller initialization.
 - *Fix:* Removed the code that was clearing the SES elements during initialization and preserving the page 0x2 contents across the controller firmware resets when the controller is in HBA mode.
- Fixed an issue where the firmware was responding to the pass through command that is sent to a non-existent (SGPIO device) target by the management software running in the background. This resulted in the firmware logs getting filled up with pass through failure messages, rendering the logs less readable.
 - *Root cause:* The firmware should check for the validity of the target before passing the command to the layers below.
 - *Fix:* The firmware added valid target check to the SCSI pass through command path and rejected the command if it was sent to the non-existent target.

2.2.1.3 Fixes and Enhancements for Firmware Release 2.50 Build 0

This release provides the following fixes and enhancements:

- Reduced the size of the basecode log buffer to match the size of the crash dump buffer in order to ensure that all entries of the basecode logs are stored in non-volatile RAM and are available for crash dump analysis.
- Fixed an issue where PBSI was disabling after updating the firmware.
 - *Root cause:* On the first boot after updating, the default PBSI configuration must be initialized based on the default settings in the SEEPROM. After setting the PBSI configuration, the RAIDstack continued to use the original settings read at boot (which are all zeros). Since the clock speed is 0, PBSI is disabled for this boot.
 - *Fix:* After initializing the user PBSI settings, the PBSI settings need to be re-read before initializing the PBSI interface.
 - *Exposure:* Firmware release 2.00b0 and later.
 - *Risk:* Low
- Fixed an issue where the controller issued an `ABORT TASK` command only 20 seconds after the Start Unit.
 - *Root cause:* The internal command logic was ignoring the flags set and only explicitly allowing certain commands to set their timeouts.
 - *Fix:* Allow Start Unit to set its timeout through internal command
 - *Exposure:* All previous versions.
 - *Risk:* Low
- Fixed an issue where the controller would assert when a 0-byte CSMP passthrough command was sent to a device.
 - *Root cause:* The firmware SMP protocol layer did not support sending 0-byte transfers to a device and would lock up.
 - *Fix:* Added additional checks in the CSMP passthrough layer to fail any passthrough command that has a 0-byte request length before trying to send it down to the device. In addition, the firmware now checks to make sure the CDB length is also valid.
 - *Exposure:* All previous versions.
 - *Risk:* Low

- Added support to return the target port descriptor as part of INQUIRY to device identification VPD page (83h).
 - *Root cause:* Storage spaces were looking for the target port descriptor be returned by SATL as part of INQUIRY to device identification VPD page (83h). Looking at both SPC5 and SAT4, this descriptor is optional and was therefore not being returned.
 - *Fix:* Return target port descriptor as part of INQUIRY to device identification VPD page (83h).
 - *Exposure:* All previous versions.
 - *Risk:* Low
- Fixed an issue where non-configured drive activity LEDs were on when there was no activity.
 - *Root cause:* The behavior was changed accidentally in release 1.50b0 and is now being reverted back.
 - *Fix:* For non-configured drives, make the activity LED state off when the drives are inactive.
 - *Exposure:* Firmware release 1.50b0 and later.
 - *Risk:* Low
- Fixed an issue where direct attached devices were starting at slot#1 instead of slot#0.
 - *Root cause:* Slot numbering was starting at 1 according to default SEEPROM settings.
 - *Fix:* The SEEPROM option was modified to start the slot numbering from 0. When the internal slot number starts at 0, the external numbering is also adjusted.
 - *Exposure:* All previous versions. Issue is present across all utilities (CTRL-A, PMCSSACLI, ARCCONF).
 - *Risk:* Low
- Changed the controller firmware behavior to continue the system startup despite a SAS scan failure (due to all drives not being spun up).
 - *Root cause:* If discovery fails for direct attached drives, the firmware will return a discovery failed status. When this happens, the firmware will abandon the topology resulting in no direct attached drives being listed. In this case, SATA drives remain in a spin up hold state and do not present the controller with any identification information. This results in a discovery timeout which causes discovery to fail.
 - *Fix:* The firmware will provide additional status when discovery fails. In the case of drives being stuck in the spin up hold state, a status value reflecting this will be returned. This value is used to display the drives that have been successfully discovered.
 - *Exposure:* All firmware versions will have this issue when there is a drive stuck in spin up hold (SUH).
 - *Risk:* Low

2.2.1.4 Fixes and Enhancements for Firmware Release 2.04 Build 0

This release provides the following fixes and enhancements:

- Added support for firmware to re-query discovery parameters of a drive such as firmware version.
- Added an `async` host event for firmware update.
- Added additional physical drive, logical drive, and physical connector parameters to PBSI interface.
- Fixed an issue where the drive temperature could be reported as 0 °C during boot.
- Modified drive temperature polling frequency to 60 seconds.
- Fixed an issue where CSMI SSP pass-through requests completed with incorrect status.
- Fixed an issue where CSMI SSP pass-through commands would not receive sense data.
- Fixed an issue with incorrect JBOD bay numbering during hot-plug.
- Fixed an issue where a multi-LUN tape device is not correctly exposed to the host.
- Fixed a controller lockup while checking SES content of a hot-added JBOD.
- Fixed several issues with invalid cabling checks for wide port configurations.

- Fixed a controller lockup during hot-plug of a tape device.
- Fixed an issue where a SATA SSD could be incorrectly flagged for "SSD Wearout" after also logging predictive failure.
- Enhanced the handling of parity errors. This includes updated logging mechanisms and processing of parity exceptions.
- Fixed an issue where SSDs could not be accessed after an SSD firmware update.
- Fixed an issue when iozone test tool and the threadx memory pool is near exhausted.

2.2.1.5 Fixes and Enhancements for Firmware Release 1.54 Build 0

This release provides the following fixes and enhancements:

- Fixed a controller lockup when a wrong SCSI error response data length of zero is returned to a BMC if a pass-through SCSI request resulted in error.
- Fixed an issue related to HDD's reporting "maximum" and "threshold" temperature values when those values are not supported by the drive.
- Fixed a controller lockup that could occur as a result of hot-adding an expander or drives to an internal connector.
- Fixed an issue where the connector name information in a dual domain configuration was not correct for the API returning enclosure status.
- Fixed an issue where the amber LED would fail to be lit if a drive was failed during discovery.

2.2.2 UEFI/BIOS Fixes

2.2.2.1 Fixes and Enhancements for UEFI/Legacy BIOS Build 1.2.4.1252/1.2.4.1254

For the UEFI/HII, this release provides the following fixes and enhancements:

- Fixed an issue where a UEFI driver boot hang was seen on a vendor platform.
 - *Root cause:* Boot hangs while processing EDK helper EFI_ERROR method.
 - *Fix:* EFI_ERROR method converted to check EFI_SUCCESS status.
 - *Risk:* Low
 - *Exposure:* All previous versions
- Fixed an issue where the Driver Health messages had the wrong connector information.
 - *Root cause:* Truncated characters were used to display connector information.
 - *Fix:* Use Long Connector Name instead of truncated characters.
 - *Risk:* Low
 - *Exposure:* All previous versions
- Updated Help and Prompt Strings.
 - *Root cause:* Needed more enhanced strings.
 - *Fix:* Updated the strings to convey more detailed information to the user.
 - *Risk:* Low
 - *Exposure:* All previous versions
- Fixed an issue where the Windows Server 2008 R2 operating system was not booting into OS when partitions were created for all raw devices.
 - *Root cause:* SCSI READ/WRITE 16 commands in the BlockIO failed.
 - *Fix:* Use SCSI READ/WRITE 10 if READ/WRITE 16 is unsupported.
 - *Risk:* Low
 - *Exposure:* All previous versions
- Fixed an issue where the controller slot number was shown as 255
 - *Root cause:* A few servers do not populate the PCI slot information during the driver execution phase.

- *Fix:* At the Exit Boot services phase, PCI slot information was getting populated and the same is reported to the firmware.
- *Risk:* Low
- *Exposure:* All previous versions

For the Legacy BIOS, this release provides the following fixes and enhancements:

- Fixed display issues in Legacy BIOS.
 - *Root cause:* Outdated copyrights version and unreadable character displayed in the POST.
 - *Fix:* Updated the copyrights and removed the unreadable character.
 - *Risk:* Low
 - *Exposure:* HBA 1000 Series adapters
- Fixed an issue where the BMC setting was unavailable with HBA1000 SEEPROM.
 - *Root cause:* The Controller Settings menu was hidden for pure HBA controllers.
 - *Fix:* The Controller Settings menu is now enabled for HBA controllers.
 - *Risk:* Low
 - *Exposure:* HBA 1000 Controllers

2.2.2.2 Fixes and Enhancements for UEFI/Legacy BIOS Build 1.2.3.1202/1.2.3.1206

There are no changes for UEFI Build 1.2.3.1202 from the previous release [Fixes and Enhancements for UEFI/Legacy BIOS Build 1.2.3.1202/1.2.3.1201](#) on page 19.

For the Legacy BIOS, this release provides the following fixes and enhancements:

- Fixed an issue where the bay number in disk utilities was listing only two digits.
- Changed the BIOS controller boot message from "Waiting for controller to start..." to "Controller firmware starting & scanning for devices..."

2.2.2.3 Fixes and Enhancements for UEFI/Legacy BIOS Build 1.2.3.1202/1.2.3.1201

For the UEFI/HII, this release provides the following fixes and enhancements:

- Fixed an issue where the drive firmware was being immediately activated for Mode E.
 - *Root cause:* Activation command was sent for Mode E.
 - *Exposure:* Drive FW Update menu.
 - *Fix:* Do not send activation command for Mode E firmware update.
- Added a numeric configuration option to set BMC I2C slave address.
 - *Root cause:* New menu to configure BMC I2C slave address.
 - *Exposure:* BMC Settings menu.
 - *Fix:* Numeric configuration option added to set BMC I2C slave address.
- Fixed an issue where Utility was reporting a successful drive firmware update on an invalid firmware image.
 - *Root cause:* SCSI status was not handled for firmware update calls.
 - *Exposure:* Drive Firmware Update menu.
 - *Fix:* Error-handling for firmware update will now consider SCSI status as well.
- Fixed an issue where the firmware version of the drive was not being updated after the drive firmware update operation.
 - *Root cause:* Latest inquiry data was not obtained from drive after the firmware update.
 - *Exposure:* Drive Firmware Update menu.

- *Fix:* The physical drive will be re-queried for the latest inquiry data after firmware update completion.
- Fixed an issue where the firmware and build numbers were displayed inconsistently in tools.
 - *Root cause:* The firmware version needs to be displayed as z.xy-w instead of z.xy bw.
 - *Exposure:* Controller Information and Administration menu.
 - *Fix:* The firmware version display was corrected to the format z.xy-w.

For the Legacy BIOS, this release provides the following fixes and enhancements:

- Fixed an issue where the firmware and build numbers were displayed inconsistently in tools.
 - *Root cause:* The firmware version needs to be displayed as z.xy-w instead of z.xy bw.
 - *Exposure:* POST and Controller Information menu.
 - *Fix:* The firmware version display was corrected to the format z.xy-w.
- Fixed an issue with memory over run.
 - *Root cause:* Unwanted variables and functions were not removed.
 - *Exposure:* Set Boot Drive.
 - *Fix:* Code Clean up. Fix issues include the following items:
 - Invalid entry "CN1:01:00 0KiB" is listed in Select Boot Device screen of CTRL-A utility.
 - CTRL-A Drives Selection displays blank screen or strange behavior after Secondary Boot device.

2.2.2.4 Fixes and Enhancements for UEFI/Legacy BIOS Build 1.2.2.1107/1.2.2.1104

For the UEFI/HII, this release provides the following fixes and enhancements:

- Fixed a failure seen with a SAS Drive firmware update from HII.
- Included the Microsoft signed UEFI driver.

For the Legacy BIOS, this release provides the following fixes and enhancements:

- Added support for selecting secondary OS Boot HBA Drive in "Select Boot Device" page of CTRL+A. Use <Ctrl+P> for selecting primary boot drive and <Ctrl+S> for selecting secondary boot drive.
- Fixed an issue where drives were not being correctly reported when configured as secondary boot drive.

2.2.3 Driver Fixes

2.2.3.1 Windows Driver Fixes

2.2.3.1.1 Fixes and Enhancements for Windows Driver Build 54013

This release includes the following fixes and enhancements:

- Fixed an issue where the Windows 2016 server would hang when the devices became unresponsive.
 - *Root cause:* Windows miniport driver was accessing the HW Soft Reset register irrespective of the controller type, resulting in a controller crash.
 - *Fix:* Added the check for HBA 1000 Series adapter and issue HW Soft Reset only to HBA 1000 Series adapter products.
 - *Exposure:* Windows drivers for HBA 1000 Series adapter products.
 - *Risk:* Low

2.2.3.1.2 Fixes and Enhancements for Windows Driver Build 52013

This release provides the following fixes and enhancements:

- PCIe slot number and host time are sent to the controller after it is reset by the driver.
- When I/O requests timed out, OS sends down task management requests such as LUN and target resets to the device. In such cases, the outstanding I/Os for that device are returned back to the OS as not completed to avoid further resets coming from the OS.
- Fixed an INF WHQL issue which is related to the new added registry items.
- Fixed an issue in the driver that caused the ARCCONF/maxView tools to wait forever for the commands sent to get the details of the adapter initiated events (AIF). For such commands, the driver should not consume the response, and this was causing application to wait forever. The response should be returned to ARCCONF/maxView instead.
- Fixed an issue in the driver that could result in the ARCCONF and maxView hang. The issue was a result of the SCSI Request Block (SRB) extension initialized incorrectly in the non-I/O path.
- Fixed an issue in the error recovery path that could lead to the OS crash. The issue was that the driver was holding on to a spinlock on a resource and causing a deadlock, while issuing the controller reset during controller recovery.
- Changed the company information from PMC to Microsemi.
- Fixed an issue where the driver incorrectly processed the returned value for processor number in the WHQL test "DP WLK– Hot Add-Device test – Verify driver support for Hot Add CPU test".
- Fixed a Windows 2008 32-bit OS installation hang issue. There was a spin lock problem for 32-bit OS, which caused the system to hang. The fix was to change StartIo spinlock to Interrupt spinlock.
- Microsoft Windows recommends that for underrun case, SRB status should not be overrun. It should be set to SUCCESS (SRB stands for SCSI Request Block, a structure used to communicate the SCSI commands from the host to the controller).
- Fixed several issues related to issuing controller reset. These issues surfaced up as BSODs when the controller was coming out of the controller reset (the highest level reset a driver can do).
- During S3/S4 test, the firmware occasionally crashes due to the driver sending the wrong Init structure data to the firmware. During driver initialization, the driver gets its parameters from the registry by querying the kernel using the registry key. If there is no match, the code should terminate the search and return. If it is run beyond the buffer, and if the OS does not zero the buffer for the registry string, the driver may get a garbage value resulting in it sending a wrong value to the firmware, resulting in the crash.

2.2.3.1.3 Fixes and Enhancements for Windows Driver Builds 50666

This release provides the following fixes and enhancements:

- Fixed an issue where the system hung during Windows boot. Restricted the CPU node support to 8 nodes to ensure the data structure does not overflow if the system has a larger configuration.

2.2.3.1.4 Fixes and Enhancements for Windows Driver Build 50663

This release provides the following Windows driver fixes and enhancements:

- Fixed an issue to report the correct number of scatter gather lists to the OS from the firmware.
- Added Windows system event logging for failures during the Windows driver initialization besides firmware panic conditions.
- Fixed an issue where references to the controller name displayed inconsistently across all the tools.
- Fixed an issue where lower IOPS performance was seen in HBA 1000 products compared with Series 8 products. This was partially caused by the driver hard coding the QD to 32 for the SAS targets. With this change, the driver sets the QD per target based on the controller firmware's settings.
- Added SAS Dual Port Device support. Fixed an issue with SAS device exposure issue.
- Added support for issuing soft resets.

2.2.3.2 Linux/VMware/XenServer Driver Fixes

2.2.3.2.1 Fixes and Enhancements for Linux, XenServer, and VMware Driver Build 54013

This release includes the following fixes and enhancements:

- Added support for XenServer 7.0.
- Added support for Ubuntu 16.04.2.
 - Kernel: 4.4.0-62-generic
- Added support for Ubuntu 14.04.5.
 - Kernel: 4.4.0-31-generic
- Added support for RHEL 7.3.
 - Kernel: 3.10.0-514
- Added support for Oracle Enterprise Linux 7.3.
 - Kernel: 3.10.0-514.el7.x86_64
 - UEK version: 4.1.12-61.1.18.el7uek.x86_64
- Added support for SLES SP2.
 - Kernel: 4.4.21.69-default
- Fixed an issue where the system crashed with the latest AACRAID driver 1.2.1-53005 for Linux kernel 3.10.101.
 - *Root cause*: There were two issues: one, the devices were all not freed when the driver was removed; two, all the devices were not being freed since expanders were allocated as `sas_expander` and then changed to a different class called end device. Now when the driver is removed, the kernel skips over the `sas_expander` class and the kernel complains.
 - *Fix*: Ensured that SAS transport is released and that all expanders are assigned to the end-device type only.
 - *Exposure*: HBA 1000 Series adapter products running Linux kernels 3.10.x (such as Debian 8.1, RHEL 7.3, and OL 6.8)
 - *Risk*: Medium
- Added improvements to the controller reset recovery.
 - *Root cause*: Several areas were improved to make the controller reset recovery procedure more reliable and responsive.
 - *Fixes*:
 1. Reduced the time to initiate the recovery process by polling the controller health more frequently (1 minute).
 2. Streamlining of the reset handler to avoid multiple controller resets sent from the driver in the event of controller hang.
 3. The driver logs the controller reset initiation into `/var/log/messages`.
 4. Reduce the burden on the recovering controller by not sending any sync commands when the controller is in a faulty or recovering state.
 5. Reduced the time-out duration for the sync timeouts to enable the recovery handlers to kick in in a timely manner.
 - *Exposure*: HBA 1000 Series adapter on VMware and Linux OSes.
 - *Risk*: Medium
- Added support to improve the packaging of the DKMS driver packages for the RPM installer.
 - *Root cause*: The older build scripts required manual intervention to build the DKMS packages for RPM.
 - *Fix*: Created the DKMS RPM-based driver installer, which does not require any additional user action to build or install.

- *Exposure:* HBA 1000 Series adapters.
- *Risk:* Low
- Fixed an issue where the Linux build script was not building only for the current kernel.
 - *Root cause:* In the Ubuntu driver build script, there is no check to make sure it builds the driver only for the installed kernel version; this causes the build script to build drivers for all the kernel modules and headers installed.
 - *Fix:* A check was added in the Ubuntu driver build path to check if proper kernel headers and modules are installed and to build the driver only for the kernel version installed and running.
 - *Exposure:* Applies to Ubuntu Linux drivers for HBA 1000 Series adapters.
 - *Risk:* Low
- Fixed an issue where the HBA 1000 16i sysfs output was in multiple lines.
 - *Root cause:* The sysfs flags entry for the driver display the compile and configuration flags as strings in multiple lines.
 - *Fix:* Each of the sysfs configuration parameters were assigned in a 64-bit bitmap that could be fitted into a single line.
 - *Exposure:* Applies to all Linux drivers for HBA 1000 Series adapters.
 - *Risk:* Low
- Fixed an issue where the kernel prevents the driver from being removed.
 - *Root cause:* The reference count of the device exposed by the driver is not zeroed.
 - *Fix:* The driver ensures that all of the allocated memory is freed properly and the reference count is zeroed.
 - *Exposure:* HBA 1000 Series adapters.
 - *Risk:* Low
- Fixed an issue where the 4K sequential write performance of the Seagate 6 TB SATA HDD was lower than expected.
 - *Root cause:* The native 4K sector drive was reported as not being an IOBypass drive, which made the driver set the maximum device queue depth to 256.
 - *Fix:* The QD is now set based on the device type, as reported by the device itself.
 - *Exposure:* Linux drivers for HBA 1000 Series adapters.
 - *Risk:* Low
- Fixed an issue where XenServer 6.5 crashed while running IOs after extended periods of testing.
 - *Root cause:* There was a memory allocation failure from XenServer when using ISA memory DMA specifier.
 - *Fix:* Removed ISA memory DMA specifier, and replaced with GFP_DMA32 where applicable.
 - *Exposure:* XenServer 6.5 driver for HBA 1000 Series adapters.
 - *Risk:* Low
- Provided a fix to terminate the driver thread when it is stuck on a periodic sync command (such as time sync that is sent to the firmware), resulting in a system hang.
 - *Root cause:* When the driver thread performs a periodic time sync and if the firmware is crashed, during that time the driver thread waits for the response that would never arrive from the firmware. This also blocks the controller recovery from happening because it blocks the reset path from the kernel.
 - *Fix:* The fix is to allow SIGTERM to terminate the driver thread, resulting in the error handlers to continue the controller recovery.
 - *Exposure:* All Linux drivers for HBA 1000 Series adapters.
 - *Risk:* Low

- Fixed an issue where the drive was being marked offline when an IOP reset was performed in the middle of a heavy I/O.
 - *Root cause:* When the SCSI mid layer marks a drive offline due to repeated failures, there was no handling in the driver to clear the offline state and/or let the drive be configured again.
 - *Fix:* The fix is to identify any drive that has been marked offline by the SCSI layer and remove the device. Then invoke a bus rescan so that the device and any further changes in the configuration can be detected and get updated in the Linux driver device map (as well as the layers above).
 - *Exposure:* All Linux drivers for HBA 1000 Series adapters.
 - *Risk:* Low
- Fixed an issue where I/O timeouts with a value of zero could potentially be created, causing premature timeout of the I/O.
 - *Root cause:* Previously the time out value was set by default to 1 second, which can be too short in cases where devices are misbehaving.
 - *Fix:* If a zero timeout is detected, set the timeout to 30 to allow for reasonable time to complete.
 - *Exposure:* VMware drivers for HBA 1000 Series adapters.
 - *Risk:* Low
- Fixed an issue where there was a potential zero memory access if the IOP reset did not go through properly.
 - *Root cause:* On IOP RESET, the PCI Memory and IO space are freed up. If the controller is not operational after the controller reset, there is a potential issue for null pointer access in the periodic time sync loop.
 - *Fix:* Terminate the periodic loop if the controller is not restored to a healthy state.
 - *Exposure:* All Linux drivers for HBA 1000 Series adapters.
 - *Risk:* Low

2.2.3.2.2 Fixes and Enhancements for Linux and XenServer Build 53005 and VMware Driver Build 53004

This release provides the following fixes and enhancements:

- Fixed an issue where the OS kernel panicked when removing the AACRAID driver.
 - *Root cause:* The driver sends wellness commands periodically to the adapter firmware. The commands also contain the driver version as well. When a custom driver is used (as in this case), the driver version size is incremented to beyond what is supported by the command ("custom" string is added to the version). This causes a buffer overflow, and, when the driver is removed, it manifests in OS kernel panic.
 - *Fix:* Ensure that the driver version size is below the permitted size (use "src" instead of "custom").
 - *Exposure:* Customers who compile their own versions of the AACRAID drivers and use it with HBA 1000 Series adapters.
 - *Risk:* Low
- Fixed an issue where the driver was reporting the adapter dead in case of a SCSI hang.
 - *Root cause:* When the driver receives an "eh abort" request (SCSI hang) from the kernel, it checks for the status of the adapter. If the adapter's `SELF_TEST_FAILED` condition is set, the driver returns without resetting the controller. This causes the kernel to offline the adapter.
 - *Fix:* First check for adapter `KERNEL_PANIC` before checking the other conditions. This works because if a `KERNEL_PANIC` is detected, the driver resets the adapter.
 - *Exposure:* All customers.
 - *Risk:* Low

- Fixed an issue where controller firmware lockup was encountered on the system while deleting units.
 - *Root cause:* When the driver does not explicitly clear the AdapterProcessed Flag, it causes the firmware to lockup.
 - *Fix:* Ensure AdapterProcessed is not set when submitting commands.
 - *Exposure:* All customers using HBA 1000 Series adapters.
 - *Risk:* Low
- Fixed an issue where customers on Ubuntu/Debian distributions did not have the documentation for building and installing the driver from the source.
 - *Root cause:* The ARC driver source is distributed in src rpm format to customers. The instructions for compiling src rpm on non-rpm distributions were not provided and non-rpm distributions did not have the required environment setup to use the src rpm files.
 - *Fix:* The driver source is now also distributed in tar gz format along with instructions to install the driver from source.
 - *Exposure:* Customers who compile and install the driver (as opposed to those using binary release drivers).
 - *Risk:* Low
- Added support to include instructions detailing the installation process of DKMS deb driver packages.
 - *Root cause:* The ARC driver release did not contain documentation on the installation methodology of DKMS deb packages.
 - *Fix:* Added DKMS deb driver installation documentation.
 - *Exposure:* Customers using DKMS deb driver packages.
 - *Risk:* Low
- Fixed an issue where VMware was displaying a PSOD (purple screen) when the driver triggered an IOP reset.
 - *Root cause:* When the driver issued an IOP reset, it released all the memory and additional resources it had and then reinitialized the driver once the reset went through. When it released the memory, it freed up fib DMA memory at an incorrect misaligned memory location.
 - *Fix:* Freed the memory at the correct DMA memory location. Fixed an additional memory leak issue.
 - *Exposure:* Customers using VMware.
 - *Risk:* Low
- Added sysfs entry to expose the driver version.
 - *Root cause:* There was no easy way to retrieve the currently running driver version.
 - *Fix:* Added sysfs entry to expose the driver version.
 - *Exposure:* Customers who need the currently running driver version without resorting to management tools.
 - *Risk:* Low
- Fixed an issue where the driver was not recovering a hung controller.
 - *Root cause:* Driver would get caught in an endless loop resetting the card.
 - *Fix:* Cleared the Health/Status register before resetting the card. Added state to transition to KERNEL_BOOTING when the firmware starts. Allowed to stay in state until KERNEL_UP_AND_RUNNING is set.
 - *Exposure:* All customers.
 - *Risk:* Low
- Removed PCI ID of controllers that are not supported by this driver.

- *Root cause:* The current driver claimed support for all the future generation of products, even though those products have their own driver.
- *Fix:* Removed PCI ID of future generation cards.
- *Risk:* Low
- Fixed driver SCSI hang on "eh reset" request from kernel.
 - *Root cause:* The driver has two pools of fibs (data transporting abstractions): one for kernel IO and requests, and the other for management commands. The issue was caused when the driver sent kernel IO-tagged fib to the management queue during error recovery.
 - *Fix:* Added pool tags for fibs to identify and prevent fibs from either pool from being sent to the wrong pool.
 - *Exposure:* All customers.
 - *Risk:* Low
- Added support for Oracle Linux (OL) 6.8.
 - *Root cause:* The driver did not support Oracle Linux 6.8.
 - *Fix:* Added support for Oracle Linux 6.8.
 - *Exposure:* Customers who require support for Oracle Linux 6.8.
 - *Risk:* Low
- Fixed an issue where kdump fails on RHEL 6.5 when it was installed on Microsemi adapter cards.
 - *Root cause:* Kdump is a Linux mechanism that allows for the capture of kernel logs and cores in case of kernel or driver crash. On centos/RHEL systems, kdump is loaded with only a single CPU enabled. When that happens, the Microsemi driver goes into a rudimentary interrupt (intx) mode (which would work in normal cases), but, due to an Intel CPU bug, interrupts are disabled/do not work in kdump mode. This bug prevents the driver from loading and the kernel logs and core from being saved.
 - *Fix:* To solve this issue, the driver forces full interrupt mode when it detects the driver is in kdump context and the number of CPUs is 1. This enabled the driver to fully load.
 - *Exposure:* Customers who use RHEL/Centos and kdump.
 - *Risk:* Low
- Fixed an issue where customers were not able to install the driver on rpm-based distributions (RHEL/OL/etc.) with custom kernels.
 - *Root cause:* Currently the ARC driver supports various Linux kernel versions by creating binary drivers for any particular kernel. When a customer uses a custom kernel and if we do not have access to that custom kernel and its headers, it would be difficult to create a driver that supports that kernel. In addition, the customer depends on us for support whenever they upgrade the kernel. The alternative is to use a DKMS driver that would support all the custom kernels. Deb DKMS drivers are already supported; need to add support for rpm DKMS drivers.
 - *Fix:* Added support to generate rpm DKMS drivers.
 - *Exposure:* Customers who use custom kernels on rpm-based OS distributions.
 - *Risk:* Low
- Added support for Oracle Linux UEK3 and UEK4 kernels.
 - *Root cause:* Currently, the driver supports UEK3 and UEK4 kernels indirectly by supporting the Oracle Linux (OL) distributions that contain either UEK3 or UEK4 kernels. So when a customer needs a particular UEK version driver, they have to use an OL distribution driver version that supports the required UEK kernel version.
 - *Fix:* Added support to generate OL UEK3 and UEK4 specific binary drivers.
 - *Exposure:* Customers who require Oracle Linux UEK3 or UEK4 specific drivers.
 - *Risk:* Low

- Fixed potential null pointer exception in case of IOP reset failure.
 - *Root cause:* On IOP RESET, the PCI memory and IO space are freed up, and once the controller is detected to be up and operational, the initialization path is invoked to recreate the IO path resources. If the controller is not operational, the IOP reset path returns with a failure. The command thread invokes check health that relies on the IOP reset mechanism to recover the controller. If the call path returns with an error, however, the driver interprets it incorrectly and continues. It then erroneously pokes a resource pool which may have been freed up by the incomplete reset mechanism in the previous step.
 - *Fix:* Make sure the driver does not poke the freed resource pool in case of an improper IOP reset.
 - *Exposure:* All customers.
 - *Risk:* Low
- Added support for Oracle Linux (OL) 7.1.
 - *Root cause:* Driver did not support Oracle Linux 7.1.
 - *Fix:* Added support for Oracle Linux (OL) 7.1.
 - *Exposure:* Customers who require support for Oracle Linux 7.1.
 - *Risk:* Low
- Added support to ensure proper timeout when the timeout set to 0.
 - *Root cause:* The kernel at times sends IO commands which at times have a timeout value of 0, which is very short for any drives (HDD or otherwise).
 - *Fix:* The driver uses a timeout of 30 seconds if it detects timeout as being set to 0.
 - *Exposure:* All customers.
 - *Risk:* Low
- Fixed an issue where the driver `eh_reset` handler times out while waiting for the driver thread to stop.
 - *Root cause:* When the adapter crashes or does not respond, the driver tries to send a reset command. In parallel the driver kthread keeps sending periodic sync commands, and because the adapter is not in the correct state, it gets stuck in a fault state. This internally happens when the driver tries to stop its kthread from running but is hung waiting from a response from the adapter.
 - *Fix:* Allow `eh_reset` to send a kill signal to the kthread, and then allow `eh_reset` to start a controller reset.
 - *Exposure:* All customers.
 - *Risk:* Low
- Fixed an issue where drives were being marked offline when IOP reset was performed in the middle of heavy IO.
 - *Root cause:* The Linux kernel marked drives offline when the adapter crashed in the midst of a heavy IO. These drives did not come back even after the adapter was reset.
 - *Fix:* Identify any drives that have been marked offline by the kernel and then remove the device. Then invoke a bus rescan in order for the device to show up in the system.
 - *Exposure:* All customers.
 - *Risk:* Low
- Improved the controller reset/recovery mechanism in Linux.
 - *Root cause:* The driver took 30 minutes to identify whether the adapter has crashed (which is not desirable). The reset logic does not care if the adapter is healthy before issuing an IOP reset, which would cause the request to timeout.

- *Fix:* Reduced the health check interval from 30 minutes to one minute. The reset logic includes the health check code in determining the IOP reset. It is necessary to avoid a soft reset mechanism and trigger a hardware reset after giving a one minute delay to allow firmware log capture.
- *Exposure:* All customers.
- *Risk:* Low
- Added support for SAS transport in the driver.
 - *Root cause:* Customers requested support of SAS transport.
 - *Fix:* Added rudimentary support for SAS transport according to customer requirement. Currently has support to expose the SAS address of the drives and expanders, and to enable them as SAS devices.
 - *Exposure:* Customers who need SAS transport functionality.
 - *Risk:* Low

2.2.3.2.3 Fixes and Enhancements for Linux, VMware, and XenServer Driver Build 52011

This release provides the following fixes and enhancements:

- Added script to upload DKMS package to Ubuntu PPA.
- Added support for Ubuntu 16.04.
- Added support for RHEL6.8.
- Added support to build DKMS deb packages.
- Add support for Ubuntu 14.04.4
- Add support for SLES 12 SP1
- Fixed an issue that caused the IRQ warnings during the driver initialization. The warning message during IRQ request was due to the usage of a deprecated flag, `IRQF_DISABLED`.
- Fixed an issue where the driver was hanging when the kernel crash and kdump were invoked from sysfs. The root cause was that the controller was in MSI-x mode, while the crash kernel driver was expecting a response from the firmware in INT-x mode.
- Under Oracle Enterprise Linux 6.5, when the kernel got updated to 3.8.13-68.1.3.el6uek.x86_64, the initramfs was not re-built correctly, which resulted in a crash. The issue was that the path to the driver file in depmod.d was wrong and has been fixed.
- Fixed an issue after a controller reset where the host time and driver versions were not resent during the controller-driver handshake.
- Implemented Soft Reset to recover controller in case IOP RESET command fails. Soft Reset is the highest level reset that a driver can do.
- Fixed an issue where the firmware crashed after the driver sent a reset request.
- Fixed an issue where the PCIe slot number information was not displayed by the tools after the controller reset. This was because the PCIe slot number was not sent to the firmware after the controller reset, and the driver now saves the slot number before reset and re-issues it to the firmware after the reset is complete.
- Fixed an issue where the driver crashes on loading into kernels above 3.18 and below 3.19. When SCSI tag support was added, the function `scsi_activate_tag`, which is required to enable the SCSI tags, did not enable it for kernels above 3.18 and below 3.19. If a kernel that is in between these two versions is installed, the driver crashes. Changed the macros to cover up to, but not including, 3.19.
- ARCCONF fails in getting controller information for HBA controllers in large configuration, (e.g., more than 90 drives). The fix was to correct the SCSI channel ID assignment.
- Fixed an issue where there was an OS kernel panic when the controller driver was removed. The wellness command buffer was overrun due to larger driver version string that was inserted when

the driver was built from the source rpm package. The fix was to make the protective copy of the driver version within size limits and change the default source driver version string to "src".

- Reordered error checks in `aac_src_check_health`, so that `SELF_TEST_FAILED` is checked after `KERNEL_PANIC`. This was preventing the controller resets from being sent down to the controller in the event where the controller reset was the only option to recover the controller.
- Added support to build script to create tgz src packages.
- Updated `readme.txt` correct steps required for DKMS installation.

2.2.3.2.4 Fixes and Enhancements for Linux, VMware, and XenServer Driver Build 50663

This release provides the following Linux, VMware, and XenServer driver fixes and enhancements:

- Fixed the issue related to the co-existence of Series7/8 and Smart-family controllers.
- Added macros to log driver and function names to default print functions.
- Added Linux system (`dmesg`) logging for driver initialization failures.
- Fixed an issue in the driver logic to ensure expander device that were hot-added or removed are reported to the OS.
- Added support for Citrix XenServer 6.5.
- Fixed an issue when a PCI error was detected, an IOCTL command was sent to the firmware from the management software, causing undefined behavior on the management software side.
- Set queue depth value to the firmware reported drive queue depth value.
- Fixed an issue where SuSE 11 SP3 failed to detect the correct boot partition.
- Added support for RHEL 7.2, SLES 12 SP1.
- Fixed an issue where the RHEL 6.6 installer could only see part of the logical drive when the LD size was bigger than 2 TB.
- Fixed an issue with Ubuntu 14.04.3 reporting the wrong LD size on a device greater than 2 TB.
- Added support to send the correct maximum MSI-X count during EEH recovery.
- Added a check before freeing the PCI-consistent memory.

2.2.4 Management Software Fixes

2.2.4.1 Fixes and Enhancements for maxView Storage Manager/ARCCONF Version 2.04 Build 22665

This release provides the following fixes and enhancements:

- Added support for vSphere 6.5 web client plugin.
- Added support for XenServer 7.0.
- Fixed an issue where maxView was not displaying Tape drive model and negotiated transfer speed.
 - *Root cause:* `ATTR_NAME_DRIVE_MODEL` was not available for the tape drive due to an unknown model name.
 - *Resolution:* Added mapping of product ID to the model so that the model name is shown properly in maxView and ARCCONF.
 - *Risk:* Medium
- Fixed an issue where maxView was not displaying the firmware version during controller firmware upgrade.
 - *Root cause:* New firmware version and build info file pointers was changed by the firmware.
 - *Resolution:* Added the new index and changed the logic for backward compatibility as well.
 - *Risk:* Low

2.2.4.2 Fixes and Enhancements for maxView Storage Manager/ARCCONF Version 2.03 Build 22476

This release provides the following fixes and enhancements:

- Enabled the configuration of the idle session timeout in maxView.
- Added support for Mode E and Mode F, along with help for expander upgrade in maxView and ARCCONF.

- Added method name, arguments, and the response data in a format for calls made to CIM in the CIMAdapter.log. Removed unwanted log messages.
- Added support for the slot information to be displayed for a drive that has a valid secondary location(slot) irrespective of enclosure for Smart Controller.
- Added code for the following items:
 - Dumping logs in Custompath.
 - Get GOS GUI and agent logs.
 - Get particular folder logs.
- Removed additional space from the set properties string in popup message box.
- Upgraded to latest version of JRE to address security issues.
- Modified check to verify if connector functional mode and pending functional mode are not in HBA mode.
- Modified code to allow 128 drives based on ADU report where it is maintained as 128.
- Added changes in storlib and ARCCONF to support Mode 3 support of SATA drive.
- Added a new Boolean "temperatureEventsGenerated", which will be set to true on the first abnormal temperature event and will be set to false once the temperature reaches normal again. This will allow one event each to be generated whenever the temperature goes from normal to abnormal and vice versa.
- Made the following name changes:
 - Changed "Hard drive access name" to "Disk Name" to sync with the logical drive and physical drive.
 - Added proper validations to display "Disk Name".
- Added a WWID of the SEP device for enclosure of the logical ID instead of from the expander device.
- Added code to capture all debug logs from controller.
- Fixed the following UX issues in the Enclosure log:
 - Fixed Enclosure power supply
 - Fixed Enclosure ID issue
- Added smart controller check for `task` and `uninit` commands.
- Fixed an issue where maxView did not detect the controller; fixed the serial number and SES descriptors to fall under ASCII character set.
- Fixed an issue in maxView where the controller could not be found after installing a configured drive when the server was powered off.

2.2.4.3 Fixes and Enhancements for maxView Storage Manager/ARCCONF Version 2.02 Build 22404

This release provides the following fixes and enhancements:

- Implemented code for `REQUERY_PHYSICAL_DEVICE` for expander, and physical drive firmware upgrade.
- Added support for specifying the PMC BMC Service Interface (PBSI) I2C address through maxView and ARCCONF.
- Added support for "save" and "playconfig" options for HBA Products, allowing users to preserve the configuration when they replace the controller.
- Added support for maxView/ARCCONF to display the new firmware image version for the 82885T expander by reading the firmware image metadata. This enables the customer to know the version of the firmware image which they are flashing.
- Fixed an issue where maxView in Linux was reporting a failure to retrieve local IP address.
- Added connector information to `controller_config.txt` support archive file.
- Refactored progress percentage update in maxView GUI, when multiple progress tasks are running in the controller.

- Added support to generate a firmware upgrade completed event as a client-generate event when the firmware upgrade is performed through the GUI.
- Added support to move the Save and Restore configuration operation from the controller node to the system node.
- Fixed an issue where the support archive could not be saved in the specified directory with ARCCONF (Linux).
- Fixed an issue where the expander firmware in maxView failed to upgrade.
- Fixed an issue where "arccnf identify" failed with the following error message: "Invalid arguments"
- Changed the ARCCONF `expanderupdate` command default chunk size from 64k to 4k.
- Provided a fix to avoid listing the local system in the delete remote system dialog.
- Fixed an issue where the maxView shortcut icon was not available in the non-English (i.e., German, Spanish, Russian, Japanese, Chinese) version of CentOS 7.2.
- Added support for the firewall script to be changed for other languages in CentOS 7.2 (i.e., Russian, German, Spanish, Japanese, Chinese).
- Fixed an issue where the Adaptec Event Monitor did not start on reboot once enabled.
- Fixed an issue where the Adaptec Event Monitor Environment was not set up properly on Ubuntu.
- Fixed an issue where there were repeated events after setting boot type property.
- Fixed an issue where both maxView and ARCCONF were not working with XenServer 6.5.
- Fixed an issue where the ARCCONF `SMP_Phyerrorlog` returned the same information for all PHYs on expanders.
- Fixed issues in remote system adding.
- Fixed an issue where maxView failed to login after failing a drive through ARCCONF `setstate` command on Linux x86.
- Fixed an issue where the Hypervisor Guest OS maxView was not showing a progress bar under the task tab for any process.
- Fixed the syntax error message during maxView installation in CentOS 6.7
- Fixed an issue where there was a difference between ARCCONF `getconfig` output for a failed drive and an available drive.
- Fixed an issue where there were Linux issues in maxView when logging in as a standard user who has maxView admin access.
- Fixed an issue where ARCCONF gave a successful message on an invalid SEEPROM image.
- Fixed an issue where the identify command with time option was not working.
- Fixed an issue where no sense data was reported when issuing ARCCONF Passthrough `read/writewithsense`.
- Fixed an issue in maxView where there was an unknown reason for a warning sign on the system level.
- Fixed an issue where the speaker status in maxView did not have enough space to show the field.
- Fixed an issue where the maxView login failed with invalid error message after clear configuration.
- Fixed an issue where maxView was not generating shortcut icons in SLES 11 SP3 OS and in the desktop in CentOS 5.10.
- Fixed an issue where maxView was not showing the progress bar for Hypervisor Guest OS.
- Fixed an issue to resolve login failure with error message "Controller firmware or Driver not responding" when there are no controllers connected.
- Fixed an issue where the "NRMFSADebug.log" was filled with many repeating entries in the Adaptec Event Monitor.
- Fixed an issue where the HDD firmware update failed from maxView/ARCCONF.
- Fixed an issue where a completed task was shown as running in maxView.
- Fixed an issue where the user was unable to delete the task log maxView.
- Fixed an issue in ARCCONF where `savesupportarchive` returned a "This PHY is vacant" message.

- Fixed the event and config update issue in maxView, when user changes multiple controller properties all at one time.
- Fixed an issue where the Process Running symbol was not displaying in maxView for any operation.
- Fixed an issue where maxView showed i2c address as Not Applicable.
- Fixed an issue where there was a difference in the controller config log information between maxView support zip and ARCCONF support zip.
- Fixed an issue where password encryption failed for the maxView agent and web-based client plugin for VMware ESXi 6 on Windows machines.
- Fixed an issue where the i2c address was unable to be changed from ARCCONF on HBA1000 controller.

2.2.4.4 Fixes and Enhancements for maxView Storage Manager/ARCCONF Version 2.01.00 Build 22270

This release provides the following fixes and enhancements:

- Added a new command to identify a device by blinking its LEDs.
- Added the ability to show SGPIO virtual SEP information to show enclosure devices for SGPIO backplanes.
- Added the ability to display physical drive mount point information.

2.3 Limitations

2.3.1 Firmware Limitations

2.3.1.1 Limitations for Firmware Release 3.02 Build 0

This release includes the following limitation:

- When a large enclosure configuration (for example, 5 enclosures * 24 drives) is hot plugged, a few drives may go undetected. If the controller and the large enclosure configuration boot at the same time, there is no issue and all the drives get detected.

2.3.1.2 Limitations for Firmware Release 2.56 Build 0

There are no known limitations for this release.

2.3.1.3 Limitations for Firmware Release 2.50 Build 0

This release includes the following limitation:

- When maxView is running on controllers that have internal connectors under Windows operating systems, the controller logs contain spurious prints pointing to a command failure.
 - *Exposure:* All controllers that have internal connectors (8i, 8i8e, 4i4e, etc.) running Windows Server OS and MaxView.
 - *Workaround:* None

2.3.1.4 Limitations for Firmware Release 2.04 Build 0

There are no known limitations for this release.

2.3.1.5 Limitations for Firmware Release 1.54 Build 0

This release includes the following limitations:

- When setting SAN policy to OnlineAll, the new setting will NOT bring the drives already discovered online; it will only change the policy. Even a reboot will not change the offline state for drives that are already discovered. Instead, this will have to be done manually per drive using the disk manager.

Newly discovered drives from the point of configuration forward will automatically be shown as online by default.

Note:

Most data centers deploy images with the SAN policy=OnlineALL as part of their images before they install new systems (if they do not plan to hook them up in a shared SAS topology).

- A drive failed during discovery is not visible to host configuration tools..
- LED update behavior inconsistent on products based on LSI SAS-2 expanders. Root cause to the expander ignoring valid LED update requests.

2.3.1.6 Limitations for Firmware Release 1.02 Build 0

This release includes the following limitations:

- Chenbro RM43260-6G JBOD and AIC expanders (e.g., AIC XJ3000-4693s) are not supported in this release.
- LED update behavior inconsistent on products based on LSI SAS-2 expanders. Root cause to the expander ignoring valid LED update requests.

2.3.2 BIOS/UEFI Limitations

2.3.2.1 Limitations for UEFI/Legacy BIOS Build 1.2.4.1252/1.2.4.1254

There are no known limitations for this release.

2.3.2.2 Limitations for UEFI/Legacy BIOS Build 1.2.3.1202/1.2.3.1206

There are no known limitations for this release.

2.3.2.3 Limitations for UEFI/Legacy BIOS Build 1.2.3.1202/1.2.3.1201

There are no known UEFI/HII limitations for this release.

This release includes the following Legacy BIOS limitations:

- Accessing the set boot drive menu in certain servers causes a memory corruption, and random hangs/screen corruption might be seen. This issue is seen mostly if the user sets a secondary boot drive without setting a primary boot drive.
WORKAROUND: Use OS tools to manage boot drives, if hang is seen from CTRL-A.
- Firmware can crash if the attached SAS switch is reset multiple times in a short period of time.

2.3.2.4 Limitations for UEFI/Legacy BIOS Build 1.2.2.1107/1.2.2.1104

There are no known limitations for this release.

2.3.2.5 Limitations for UEFI/Legacy BIOS Build 1.2.0.1003

This release includes the following limitations.

- For CTRL-A and UEFI/HII:
 - Bay number-based sorting is not implemented. Drives will be sorted in phy order.
 - Drive identification operations are not supported in HBA mode.

2.3.3 Driver Limitations

2.3.3.1 Windows Driver Limitations

2.3.3.1.1 Limitations for Windows Driver Build 54013

There are no known limitations for this release.

2.3.3.1.2 Limitations for Windows Driver Build 52013

This release includes the following Windows limitation:

- In a configuration where the OS is installed on our controller and when the controller is crashed artificially under a heavy workload, the system will experience a BSOD (no known workaround).

2.3.3.1.3 Limitations for Windows Driver Build 50666

This release includes the following limitation:

- When an OS is installed on drives that cause IO timeouts, the controller may not boot to the OS properly because it is unable to read data from the drives. This can lead to continuous IO retries from the OS that result in a system hang.

WORKAROUND: Replace the drives with known operational drives.

2.3.3.1.4 Limitations for Windows Driver Build 50637

This release includes the following limitations:

- When an OS is installed on drives that cause IO timeouts, the controller may not boot to the OS properly because it is unable to read data from the drives. This can lead to continuous IO retries from the OS that result in a system hang.

WORKAROUND: Replace the drives with known operational drives.

2.3.3.2 Linux, VMware, and XenServer Driver Limitations

2.3.3.2.1 Limitations for Linux, VMware, and XenServer Driver Build 54013

This release includes the following XenServer limitations:

- There is a bug in the XenServer OS which prevents certification from passing. Customers running XenServer 7.0 should apply hotfix XS70E030, which can be found at the following link:
<https://support.citrix.com/article/CTX223825>

There are no known Linux or VMware limitations for this release.

2.3.3.2.2 Limitations for Linux and XenServer Build 53005 and VMware Driver Build 53004

There are no known limitations for this release.

2.3.3.2.3 Limitations for Linux, VMware, and XenServer Driver Build 52011

This release includes the following Linux, VMware, and XenServer limitations:

- A PSOD error occurs whenever the controller firmware is locked up and when the driver tries to reset the adapter.
- HBA 1000 driver v1.2.1-B5xxxx does not discover enclosure, but the inbox driver version 1.2.0-B30300 does (no workarounds are available).
- `ls SCSI -t` command is not supported for retrieving the SAS addresses of the attached targets, as the SAS transport layer support is missing in the AACRAID driver. This limitation exists starting with the first release of the product.
- If the controller firmware locks up due to misbehaving targets or for any other reason, the driver attempts to reset the controller firmware. In some scenarios, the recovery of the controller does not happen, as the driver fails to re-initialize the controller firmware.

2.3.3.2.4 Limitations for Linux Driver Build 50663

This release includes the following Linux limitations:

- Linux drivers hang on hot-plug of drives during I/O load.
- In SuSE 11, SP3 (and RHEL/CentOS 6.4) (32-bit and 64-bit), the inbox driver takes precedence over third-party drivers. As a result, the OS loads the inbox driver rather than installing from the out-of-box driver. (Note that RHEL/CentOS 6.4 is included in the release package as-is, without support.)

WORKAROUND: The aacraid module must be added to the blacklist during installation for both 32- and 64-bit out-of-box drivers as follows:

- For SuSE 11, SP3:

1. Boot from the SuSE installation DVD.
2. Add 'brokenmodules=aacraid dud=1' to the boot menu.
3. Press the F6 key to update the driver during installation.
4. Insert the USB driver disk.
5. On the 'Welcome screen', press CTRL+ALT+F2 to switch to the console and then type the following commands:

```
# insmod ./update/000/modules/aacraid.ko
# rm -rf /etc/modprobe.d/blacklist /etc/modprobe.d/noload
```

6. Press CTRL+ALT+F7 to return to the installation screen and continue the installation.
7. When the installation is 60-90% complete, press CTRL+ALT+F2 to switch back to the console.
8. Type the command:

```
# cp -a /update/install /mnt/tmp
```

9. Press CTRL+ALT+F7 to return to the installation screen and complete the installation.

- For RHEL/CentOS 6.4:

1. Add "blacklist=aacraid linux dd" to the Boot menu.
2. When prompted to "Please choose the Driver Update medium", highlight the USB partition or CD Drive medium and then click OK.
3. On the Welcome screen, press CTRL+ALT+F2 to switch to the console.
4. Type this command:

```
Remove the entry "blacklist aacraid" from /etc/modprobe.d/anaconda.conf
modprobe aacraid
```

5. Press CTRL+ALT+F7 to return to the Welcome screen.
6. Complete the installation following the on-screen instructions

- SLES 10 SP4 installation hangs with the inbox driver. A fix will be available for a future release.

2.3.3.2.5 Limitations for Linux Driver Build 50639

This release includes the following limitations:

- The Linux OS may hang during boot if the BIOS for the HBA 1000 Series adapter has been loaded before an Microsemi Adaptec RAID controller (ARC) adapter (Series 6/7/8) in the same system.
WORKAROUND: Swap the two controllers on the chassis to load the BIOS for the ARC product before the BIOS for the HBA 1000 Series adapter.
- The Linux OS does not boot if there are two or more ARC products in the system along with the HBA 1000 Series adapter.

2.3.3.2.6 Limitations for VMware Driver Build 50663

This release includes the following limitations:

- An error handler-triggered reset could potentially cause a firmware crash with the current release driver.

2.3.3.2.7 Limitations for VMware Driver Build B50629

This release includes the following limitation:

- ESXi 6 installation fails with a PSOD when the HBA 1000 Series adapter and an Microsemi Adaptec Series 7 controller are present in the system.
 WORKAROUND: Swap the two controllers on the chassis to load the BIOS for the ARC product before the BIOS for the HBA 1000 Series adapter.

2.3.3.2.8 Limitations for XenServer Driver Build 50663

This release includes the following Citrix XenServer limitation:

- An error handler-triggered reset could potentially cause a firmware crash with the current release driver.
- XenServer 6.5 fails to install when using a USB drive for driver installation.
 WORKAROUND: To install the provided controller driver with Citrix XenServer, you must burn the XenServer driver iso image to a CD or DVD. You will be prompted to insert the XenServer driver CD/DVD twice. You will need the XenServer installation CD to complete this task. You must have administrator privileges to install the driver image.

2.3.3.3 General Limitations for Driver Build 50659

This release includes the following general limitation:

- The SAS address of drives cannot be retrieved using the "lsscsi -t" command.

2.3.4 Management Software Limitations

2.3.4.1 Limitations for maxView Storage Manage/ARCCONF Version 2.04 Build 22665

There are no known limitations for this release.

2.3.4.2 Limitations for maxView Storage Manage/ARCCONF Version 2.03 Build 22476

There are no known limitations for this release.

2.3.4.3 Limitations for maxView Storage Manager/ARCCONF Version 2.02 Build 22404

There are no known limitations for this release.

2.3.4.4 Limitations for maxView Storage Manager/ARCCONF Version 2.01.00 Build 22270

This release includes the following limitations:

- The ARCCONF SEEPROM UPDATE command is not supported for this product.

Refer to the *README: maxView Storage Manager & ARCCONF Command Line Utility* for a full list of known issues applicable to Smart-Family products using the maxView Storage Manager and ARCCONF utilities.

2.3.4.5 Limitations for maxView Storage Manager/ARCCONF Version 2.00.00 Build 21811

This release includes the following limitations specific to the HBA 1000 Series adapter:

- SES passthrough commands to expanders are failing.
- The Task ID of a secure erase changes in the maxView Storage Manager or the ARCCONF CLI while the task is in progress. There is no workaround for this because Smart-firmware-based products have no concept of task scheduling or task IDs.

Refer to the *README: maxView Storage Manager & ARCCONF Command Line Utility* for a full list of known issues applicable to Smart-Family products using the maxView Storage Manager and ARCCONF utilities.

3 Implementing a Host Application for a Bus Management Controller

As part of the firmware release package, Microsemi provides PBSI reference code for implementing a host application for a Bus Management Controller (BMC) to access details about this product and devices attached to it.

The reference files include examples of the commands shown in [Table 3 • PBSI Commands](#).

Table 3 • PBSI Commands

Command	Description
get_adapter_handles	Displays the adapter handles
get_adapter_info	Displays the adapter information
get_version_info	Displays the PBSI and DST version information
get_adap_vital_stats	Displays the vital adapter information
get_gb_info	Displays the green backup unit information
get_topology_info	Displays the adapter topology information

To compile the PBSI application:

1. Get the appropriate I2C libraries.
2. Edit the host_interfacing.c file to use the platform-specific APIs.
3. Edit the makefile to use the appropriate toolchain for compilation.



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