Release Notes

Microsemi Adaptec Host Bus Adapter 1000 Series

Microsemi®

Power Matters.™

Microsemi makes no warranty, representation, or guarantee regarding the information contained herein or the suitability of its products and services for any particular purpose, nor does Microsemi assume any liability whatsoever arising out of the application or use of any product or circuit. The products sold hereunder and any other products sold by Microsemi have been subject to limited testing and should not be used in conjunction with mission-critical equipment or applications. Any performance specifications are believed to be reliable but are not verified, and Buyer must conduct and complete all performance and other testing of the products, alone and together with, or installed in, any end-products. Buyer shall not rely on any data and performance specifications or parameters provided by Microsemi. It is the Buyer's responsibility to independently determine suitability of any products and to test and verify the same. The information provided by Microsemi hereunder is provided "as is, where is" and with all faults, and the entire risk associated with such information is entirely with the Buyer. Microsemi does not grant, explicitly or implicitly, to any party any patent rights, licenses, or any other IP rights, whether with regard to such information itself or anything described by such information. Information provided in this document is proprietary to Microsemi, and Microsemi reserves the right to make any changes to the information in this document or to any products and services at any time without notice.

Microsemi Corporation (Nasdaq: MSCC) offers a comprehensive portfolio of semiconductor and system solutions for aerospace & defense, communications, data center and industrial markets. Products include high-performance and radiation-hardened analog mixed-signal integrated circuits, FPGAs, SoCs and ASICs; power management products; timing and synchronization devices and precise time solutions, setting the world's standard for time; voice processing devices; RF solutions; discrete components; enterprise storage and communication solutions; security technologies and scalable anti-tamper products; Ethernet solutions; Power-over-Ethernet ICs and midspans; as well as custom design capabilities and services. Microsemi is headquartered in Aliso Viejo, California, and has approximately 4,800 employees globally. Learn more at **www.microsemi.com**.

The technology discussed in this document may be protected by one or more patent grants.

Revision History

Issue	Issue Date	Details of Change
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.

Contents

List of Tables

Software License Agreement

PLEASE READ CAREFULLY: THE USE OF THIS SOFTWARE IS SUBJECT TO THE SOFTWARE LICENSE TERMS OF MICROSEMI, INC. AND OTHER LICENSORS WHOSE SOFTWARE MAY BE BUNDLED WITH THIS PRODUCT.

BY YOUR USE OF THE SOFTWARE INCLUDED WITH THIS PRODUCT YOU AGREE TO THE LICENSE TERMS REQUIRED BY THE LICENSOR OF THAT SOFTWARE, AS SET FORTH DURING THE INSTALLATION PROCESS. IF YOU DO NOT AGREE TO THE LICENSE TERMS APPLICABLE TO THE SOFTWARE, YOU MAY RETURN THE ENTIRE UNUSED PRODUCT FOR A FULL REFUND.

In return for acquiring a license to use the Microsemi software, which may include software from third party licensors and patches made available by Microsemi ("Software"), and the related documentation, you agree to the following terms and conditions:

1. License. This Agreement grants you, the Licensee, a license to:

    a. Use the Software on a single computer system, which is not intended for use by more than five (5) users; and:

    b. Make one copy of the Software in machine readable form solely for back-up purposes, provided you reproduce Microsemi's copyright proprietary legends. Notwithstanding the foregoing, the Software may be used on the home, laptop or other secondary computer of the principal user of the Software, and an additional copy of the Software may be made to support such use. As used in this license, the Software is "in use" when it is either loaded into RAM or installed on a hard disk or other permanent memory device. The Software may be "in use" on only one computer at any given time. (Different license terms and fees are applicable for networked or multiple user applications.) As a specific condition of this license, you agree to use the Software in compliance with all applicable laws, including copyright laws, and that you will not copy, transmit, perform or distribute any audio or other content using the Software without obtaining all necessary licenses or permissions from the owner of the content.

2. Restrictions. You may not distribute copies of the Software to others or electronically transfer the Software from one computer to another over a network. You may not post or otherwise make available the Software, or any portion thereof, in any form, on the Internet. You may not use the Software in a computer service business, including in time sharing applications. The Software contains trade secrets and, in order to protect them, you may not decompile, reverse engineer, disassemble, or otherwise reduce the Software to a human-perceivable form. YOU MAY NOT MODIFY, ADAPT, TRANSLATE, RENT, LEASE, LOAN, RESELL FOR PROFIT, DISTRIBUTE, NETWORK OR CREATE DERIVATIVE WORKS BASED UPON THE SOFTWARE OR ANY PART THEREOF.

3. Ownership of Software. As Licensee, you own the media upon which the software is recorded or fixed, but Microsemi and its licensors retain title and ownership of the Software recorded on the original media and all subsequent copies of the Software, regardless of the form or media in which or on which the original and other copies may exist. This license is not a sale of the Software or any copy.

4. Confidentiality. You agree to maintain the Software in confidence and that you will not disclose the Software to any third party without the express written consent of Microsemi. You further agree to take all reasonable precautions to preclude access of unauthorized persons to the Software.

5. Term. This license is effective until January 1, 2045, unless terminated earlier. You may terminate the license at any time by destroying the Software (including the related documentation) together with all copies or modifications in any form. Microsemi will have the right to terminate our license immediately if you fail to comply with any term or condition of this Agreement. Upon any termination, including termination by you, you must destroy the Software (including the related documentation), together with all copies or modifications in any form.

6. Special Terms Applicable to Databases. Where a database is included with the Software, you acknowledge that it is licensed only in connection with the use of the Software to perform disc creation, and that the database and all data derived therefrom must be maintained in confidence in accordance with the provisions of Section 4. This license does not grant you any rights to distribute or disclose such database or data.

7. Limited Warranty. Microsemi and its Licensor warrant only that the media upon which the Software is furnished will be free from defects in material or workmanship under normal use and service for a period of thirty (30) days from the date of delivery to you. MICROSEMI AND ITS LICENSORS DO NOT AND CANNOT WARRANT THE PERFORMANCE OR RESULTS YOU MAY OBTAIN BY USING THE SOFTWARE OR DOCUMENTATION. THE FOREGOING STATES THE SOLE AND EXCLUSIVE REMEDIES MICROSEMI AND ITS LICENSORS WILL PROVIDE FOR BREACH OF WARRANTY. EXCEPT FOR THE FOREGOING LIMITED WARRANTY, MICROSEMI AND ITS LICENSORS MAKE NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED, AS TO NON-INFRINGEMENT OF THIRD PARTY RIGHTS, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow the exclusion of implied warranties or limitations on how long an implied warranty may last, so the above limitations may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

8. The entire liability of Microsemi and its licensors, and your exclusive remedy for a breach of this warranty, shall be:

   a. The replacement of any media not meeting the above limited warranty which is returned to Microsemi; or:

   b. if Microsemi or its distributor is unable to deliver replacement media which is free from defects in materials or workmanship, you may terminate this Agreement by returning the Software and your money will be refunded.

9. Limitation of Liability. IN NO EVENT WILL MICROSEMI OR ITS LICENSORS BE LIABLE TO YOU FOR ANY INCIDENTAL, CONSEQUENTIAL OR INDIRECT DAMAGES, INCLUDING ANY LOST PROFITS, LOST SAVINGS, OR LOSS OF DATA, EVEN IF MICROSEMI OR A LICENSOR HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, OR FOR ANY CLAIM BY ANY OTHER PARTY. Some states do not allow the exclusion or limitation of special, incidental, or consequential damages, so the above limitation or exclusion may not apply to you.

10. Export. You acknowledge that the laws and regulations of the United States and other countries may restrict the export and re-export of the Software. You agree that you will not export or re-export the Software or documentation in any form in violation of applicable United States and foreign law.

11. Government Restricted Rights. The Software is subject to restricted rights as follows. If the Software is acquired under the terms of a GSA contract: use, reproduction or disclosure is subject to the restrictions set forth in the applicable ADP Schedule contract. If the Software is acquired under the terms of a DoD or civilian agency contract, use, duplication or disclosure by the Government is subject to the restrictions of this Agreement in accordance with 48 C.F.R. 12.212 of the Federal Acquisition Regulations and its successors and 49 C.F.R. 227.7202-1 of the DoD FAR Supplement and its successors.

12. General. You acknowledge that you have read this Agreement, understand it, and that by using the Software you agree to be bound by its terms and conditions. You further agree that it is the complete and exclusive statement of the agreement between Microsemi and you, and supersedes any proposal or prior agreement, oral or written, and any other communication between Microsemi and you relating to the subject matter of this Agreement. No additional or any different terms will be enforceable against Microsemi unless Microsemi gives its express consent, including an express waiver of the terms of this Agreement, in writing signed by an officer of Microsemi. You assume full responsibility for the use of the Software and agree to use the Software legally and responsibly. This Agreement shall be governed by California law, except as to copyright matters, which are covered by Federal law. This Agreement is deemed entered into at Sunnyvale, California by both parties. Should any provision of this Agreement be declared unenforceable in any jurisdiction, then such

provision shall be deemed severable from this Agreement and shall not affect the remainder hereof. All rights in the Software not specifically granted in this Agreement are reserved by Microsemi.

Should you have any questions concerning this license, contact:

Microsemi Corporation
Corporate Headquarters
One Enterprise
Aliso Viejo, CA 92656 USA

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	September 15, 2016
Firmware Version	2.04 build 0 (basecode 05.00.021.000)[1]
Microsemi Adaptec Controller Configuration Utilities (ARCCONF Command Line Interface, maxView Storage Manager, maxView vSphere Plugin, Boot USB)	2.02.22404
Drivers Package Version	B52013 [Windows] B52011 [Linux, VMware, and XenServer]

1.2 Release Components

Download the following firmware, drivers, host management software, and supporting documentation for your HBA 1000 Series product from 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 2.04 build 0 of the HBA 1000 firmware, version 1.2.3.1202 of the Microsemi Adaptec UEFI/HII, and version 1.2.3.1201 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 update. Compatibility issues may be seen with untested OS versions.

Microsoft Windows

- Microsoft Windows Server 2016
- Microsoft Windows Server 2012 R2, 2008 R2 SP1, SBS 2011 SP2 (64-bit)
- Microsoft Windows 10, 8.1, 8, 7 (64-bit)

Linux:

- Red Hat Enterprise Linux/CentOS 7.2, 7.1 (64-bit)
- Red Hat Enterprise Linux/CentOS 6.7, 6.6 (64-bit)
- Red Hat Enterprise Linux/CentOS 5.11, 5.10 (64-bit)
- SuSE Linux Enterprise Server 12 SP1 (64-bit)
- SuSE Linux Enterprise Server 12 (64-bit)
- SuSE Linux Enterprise Server 11 SP4, SP3 (64-bit)
- Ubuntu Linux 16.04
- Ubuntu Linux 14.04.3, 14.04.2 (64-bit)
- Ubuntu Linux 12.04.5, 12.04.4 (64-bit)
- Oracle Enterprise Linux 7.1 and 7.2
- Oracle Enterprise Linux 6.5
- Fedora 22

Citrix

- Citrix XenServer 6.5.1 (64-bit)

Virtual OS Environments

- VMware ESXi 6.0 U1, 6.0 (64-bit)
- VMware ESXi 5.5 U3, 5.5 U2, 5.1 U1, 5.1 (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 5.5 and 6.0 (64-bit)
  - XenServer 6.5.1 (64-bit)

- Microsemi Adaptec maxView Storage Manager

- • Windows (64-bit)
- • Linux (64-bit)
- • VMware EXSi 5.5 and 6.0 (64-bit)
- • XenServer 6.5.1 (64-bit)

- • Microsemi Adaptec maxView vSphere Plugin
  - • vCenter 5.5 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 6.5.1 (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 & 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 & 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 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 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 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 & 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 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.

2.2.1.2 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 1.2.3.1202/1.2.3.1201
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 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.

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 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.

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

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.

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.

2.2.3 Driver Fixes

2.2.3.1 Windows Driver Fixes

2.2.3.1.1 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.
- Change 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.

2.2.3.1.2 Fixes and Enhancements for Windows Driver Builds [Windows] 50666 and [Linux, VMware, and XenServer] 50663

This release provides the following fixes and enhancements:

- Fixed and 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.

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 2TB.
- Fixed an issue with Ubuntu 14.04.3 reporting the wrong LD size on a device greater than 2TB.

- Added support to send the correct maximum MSI-X count during EEH recovery.
- Added a check before freeing the PCI-consistent memory.

2.2.3.1.3 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, 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 HBA1000 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.

2.2.3.2.2 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 2TB.
- Fixed an issue with Ubuntu 14.04.3 reporting the wrong LD size on a device greater than 2TB.
- 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 2.02 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 "arcconf 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.

2.2.4.2 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 Version 2.04 Build 0

There are no known limitations for this release.

2.3.1.2 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.

2.3.1.3 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 1.2.3.1202/1.2.3.1201

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.

2.3.2.2 Limitations for UEFI/Legacy BIOS Build 1.2.2.1107/1.2.2.1104

There are no known limitations for this release.

2.3.2.3 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 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).

2.3.3.1.2 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.

2.3.3.1.3 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 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).
- `Lsscsi –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.

2.3.3.2.2   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.

2.3.3.2.3   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.

2.3.3.2.4 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.

2.3.3.2.5 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.

2.3.3.2.6 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 Manager/ARCCONF Version 2.02 Build 22404

There are no known limitations for this release.

2.3.4.2 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.

2.3.4.3 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.