1. About This Release

The release described in this document includes firmware, OS drivers, tools, and host management software for the SmartRAID 3200 and SmartHBA 2200 solutions from Microchip.

1.1 Release Identification

The firmware, software, and driver versions for this release are shown in the following table.

Table 1-1. Release Summary

<table>
<thead>
<tr>
<th>Solutions release</th>
<th>3.1.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Package release date</td>
<td>February 11, 2022</td>
</tr>
<tr>
<td>Firmware version</td>
<td>3.01.09.56</td>
</tr>
<tr>
<td>UEFI/Legacy BIOS</td>
<td>1.4.6.2/1.4.6.2</td>
</tr>
</tbody>
</table>

Driver versions

Windows Drivers:
- Windows 2022, 2019, 2016, Windows 11, 10: 1010.24.0.1005

Linux SmartPQI:
- RHEL 7/8: 2.1.16-030
- SLES 12/15: 2.1.16-030
- Ubuntu 18/20/21: 2.1.16-030
- Oracle Linux 7/8: 2.1.16-030
- Citrix Xenserver 8: 2.1.16-030
- Debian 10/11: 2.1.16-030
- CentOS 7/8: 2.1.16-030

VMware:
- VMware ESX 6/7: 4252.0.103

FreeBSD/Solaris:
- FreeBSD 11/12/13: 4210.0.1004
- Solaris: 11: 11.4120.0.1005

1.2 Files Included in this Release

This section details the files included in this release.

Table 1-2. Firmware Files

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Pre-Assembly Use</th>
<th>Post-Assembly Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>SmartFWx200.bin</td>
<td>Production-signed programmable NOR Flash File. Use to program NOR Flash for boards that are already running firmware.</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

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### Table 1-3. Firmware Programming Tools

<table>
<thead>
<tr>
<th>Tool</th>
<th>Description</th>
<th>Executable</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCCONF</td>
<td>ARCCONF CLI Utility</td>
<td>ARCCONF BXXXXX.zip</td>
</tr>
<tr>
<td>maxView</td>
<td>maxView Utility</td>
<td>MAXVIEW XXX BXXXXX.zip</td>
</tr>
</tbody>
</table>

**Driver Files**

### Table 1-4. Windows Drivers

<table>
<thead>
<tr>
<th>OS</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Server 2022, 2019, 2016, Windows 11, 10</td>
<td>x64</td>
</tr>
</tbody>
</table>

### Table 1-5. Linux Drivers

<table>
<thead>
<tr>
<th>OS</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>RHEL 8.5, 8.4, 8.3, 8.2, 8.1, 7.9, 7.8, 7.7</td>
<td>x64</td>
</tr>
<tr>
<td>CentOS 8.4, 8.3, 8.2, 8.1, 8.0, 7.9, 7.8, 7.7</td>
<td>x64</td>
</tr>
<tr>
<td>SLES 12 SP5, SP4</td>
<td>x64</td>
</tr>
<tr>
<td>SLES 15 SP3, SP2, SP1</td>
<td>x64</td>
</tr>
<tr>
<td>Ubuntu 20.04.3, 20.04.2, 20.04, 18.04.5, 18.04.4</td>
<td>x64</td>
</tr>
<tr>
<td>Ubuntu 21.04</td>
<td>x64</td>
</tr>
<tr>
<td>Oracle Linux 7.9, 7.8 UEK6U3</td>
<td>x64</td>
</tr>
<tr>
<td>Oracle Linux 8.4, 8.3 UEK6U3</td>
<td>x64</td>
</tr>
<tr>
<td>Debian 11.1, 10.10</td>
<td>x64</td>
</tr>
<tr>
<td>Fedora 35 (inbox)</td>
<td>x64</td>
</tr>
<tr>
<td>XenServer 8.2</td>
<td>x64</td>
</tr>
</tbody>
</table>

### Table 1-6. FreeBSD, Solaris, and VMware Drivers

<table>
<thead>
<tr>
<th>OS</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESX6.5 U3/U2</td>
<td>x64</td>
</tr>
<tr>
<td>ESX6.7 U3/U2</td>
<td>x64</td>
</tr>
<tr>
<td>ESX7.0 U3/U2</td>
<td>x64</td>
</tr>
<tr>
<td>FreeBSD 13, 12.3, 11.4</td>
<td>x64</td>
</tr>
<tr>
<td>Solaris 11.4</td>
<td>x64</td>
</tr>
</tbody>
</table>

**Host Management Software**
<table>
<thead>
<tr>
<th>Description</th>
<th>OS</th>
<th>Executable</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCCONF Command Line Utility</td>
<td>Windows x64, Linux x64</td>
<td>See the arcconf_B#####.zip for the installation executables for the relevant OS.</td>
</tr>
<tr>
<td></td>
<td>VMware 6.5 and above</td>
<td></td>
</tr>
<tr>
<td></td>
<td>XenServer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>UEFI support</td>
<td></td>
</tr>
<tr>
<td>maxView Storage Manager</td>
<td>Windows x64, Linux x64</td>
<td>See the maxview_linux_B#####.zip, maxview_win_B#####.zip, and maxview_vmware_B#####.zip for the installation executables.</td>
</tr>
<tr>
<td></td>
<td>VMware 6.5 and above</td>
<td></td>
</tr>
<tr>
<td></td>
<td>XenServer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>UEFI support</td>
<td></td>
</tr>
<tr>
<td>maxView vSphere Plugin</td>
<td>VMware 6.5 and above</td>
<td>See the maxview_vmware_B#####.zip for the installation executables.</td>
</tr>
<tr>
<td>Boot USB (offline or pre-boot) for ARCCONF and maxView Storage Manager</td>
<td>Linux x64</td>
<td>See the maxview_offline_bootusb_B#####.zip for the .iso file.</td>
</tr>
</tbody>
</table>
What's New?
This section shows what's new in this release.

2.1 Fixes and Enhancements
This section shows the fixes and enhancements for this release.

2.1.1 Firmware Fixes
This section shows the firmware fixes and enhancements for this release.

2.1.1.1 Fixes and Enhancements for Firmware Release 3.01.09.56
This release provides the following fixes and enhancements.

- **Added SAS/SATA Passive SED Support.**
- **Added support for Kioxia TH58TFXX NAND.** Firmware will prevent downgrade to prior releases on boards with this type of NAND present.
- **Added UBM 5 support.**
- **Removed requirement that UBM backplane type 0 is not supported.**
- **Fixed an issue where a transforming logical drive may be reported in the Failed state for cache-less controllers after an unsafe reboot.**
  - **Root cause:** During transformation on cache-less controllers, the transformation backup data and a checksum is saved on one of the physical drives in the logical drive. After an unsafe reboot of the system, the firmware used an incorrect physical drive index to check for existing transformation backup data and encountered a checksum mismatch because it read a different physical drive than where the transformation backup data was previously written. Due to the checksum mismatch the transformation backup data is not available and the logical drive is failed.
  - **Fix:** The firmware will use the correct physical drive index to check for existing transformation backup data and if needed, firmware will check all the physical drives in the logical drive to find existing transformation backup data.
  - **Risk:** Low
- **Fixed a possible lockup during surface scan with heavy I/O and drive replacements.**
  - **Root cause:** During surface scan, there was a potential race condition between background and completion task. If completion task is interrupted in middle of clearing metadata, the background task could come in and update logical request pointer. Completion task then locked up trying to free this logical request pointer.
  - **Fix:** Free the logical request pointer first when completion task runs and then signal background task to proceed
  - **Risk:** Low
- **Improved performance for sequential writes at a high queue depth and large transfer size.**
  - **Root cause:** Staging code is not waiting long enough for internal memory resources to become available.
  - **Fix:** Increase time to wait for internal memory resources to become available.
  - **Risk:** Medium
- **Fixed a possible lockup when a drive fails due to handle swaps.**
  - **Root cause:** During the LUN reset, the drive was failed because maximum number of handle swaps was reached. The task management service did not recognize this failure and kept going as if drive was responsive.
  - **Fix:** Complete TMF commands when drive is failed to force all TMFs to complete to host.
  - **Risk:** Low
- **Fixed a 0x1E30 lockup during second logical drive creation without backup power source and with existing MaxCache pair.**
  - **Root cause:** When a second logical is being created without a backup power source present, the DDR cache configuration is changed from 100% write to 100% read (read-only). Due to a pre-existing MaxCache logical drive, the DDR cache configuration should remain as 100% write. Since the DDR cache
configuration changed to 100% read (read-only). READ AHEAD request gets set in cache module and when MaxCache processes the request, the lockup occurs as READ AHEAD requests are not supported by MaxCache.

- **Fix**: During logical drive creation firmware will not change the DDR cache configuration to 100% read (read-only) when the backup power is missing and MaxCache is present.
- **Risk**: Low

• Fixed a 0x17005 lockup while resuming transformation after a cold boot when a logical drive under-going a transformation is moved from a cache-less controller to a cache-supported controller.
  - **Root cause**: While the system is booting up, transformation is trying to restore the transformation backup data by doing a DMA from DDR cache for calculating and validating transformation progress data checksum. This DMA executed an uninitialized callback function which causes the lockup.
  - **Fix**: Correctly initialize the callback function used to restore the transformation data.
  - **Risk**: Low

• Fixed an issue where a transforming logical drive failed when system rebooted with transforming logical drive and newly created logical drive.
  - **Root cause**: When the backup power source is removed during transformation, a transformation shutdown happens. Transformation shutdown will suspend the transformation and save the progress information in the transformation progress area in the drive's RAID meta data. This progress info has the current configuration signature also. When a new logical drive is created the configuration signature is changed and it is now different than what was stored in the transformation progress information. During system reboot firmware sees that the configuration signature present in the drive RAIDX metadata and transformation progress area are different, so failed the transforming logical drive.
  - **Fix**: While creating a logical drive, always update the transformation progress information with updated global signature if the transformation was running and was shutdown.
  - **Risk**: Low

• Fixed a problem where I/O latency may be higher for logical drive I/O with a predictive failure drive.
  - **Root cause**: Firmware may decide to optimize a read to a Predictive Failure drive when it should not optimize the read and may decide not to optimize a read to a Predictive Failure drive when it should optimize the read. If the request was a retry, this read optimization should not be done, but the condition which determines the retry type was incorrect.
  - **Fix**: Correctly determine the retry type.
  - **Risk**: Low

• Fixed an issue where a loss of redundant path was seen on logical drive failure with single domain configuration.
  - **Root cause**: In a single domain topology, if all physical drives are removed causing the logical drive to be failed, a loss of redundant firmware is incorrectly reported by host management software. The message occurs because firmware incorrectly defaults to reporting redundant paths when there are no physical drives present for the failed logical drive.
  - **Fix**: Report no redundant paths are present for a logical drive when there are no physical drives present.
  - **Risk**: Low

• Fixed a TLB exception issue observed during surface scan retry failure.
  - **Root cause**: Firmware accessed a NULL address because the logical drive data structure was not initialized correctly in the surface scan retry code path.
  - **Fix**: Initialize the logical drive data structure before calling surface scan for a retry.
  - **Risk**: Low

• Fixed an issue where only one of two NVMe drives were discovered with a x4 UBM backplane.
  - **Root cause**: The GPIO pin for NVMe clock enablement pin is selected using the UBM DFC index. The code used the physical PHY.
  - **Fix**: Use the UBM DFC index to select the GPIO pin.
  - **Risk**: Low

• Fixed an issue where the devices are not discovered when an active optical cable is connected to the controller.
  - **Root cause**: Firmware did not use the correct sequence when writing to a CPLD register to support active optical cables.
  - **Fix**: Firmware uses the correct sequence to write to CPLD registers.
- Risk: Low

- Fixed a firmware hang issue that can occur with logical drive expansion or spare assignment process on logical drives created with SEDs.
  - Root cause: When a SED is added to an array as part of an array expansion or spare assignment process, the newly added SED goes through the SED qualification process, and the host IOs for the drive are put in a retry queue. Due to incorrect logic, firmware can never process the retry queue and becomes stuck in a loop.
  - Fix: Change the firmware to process the pending commands in the retry queue after the SED qualification is complete.
  - Risk: Low

- Fixed an issue where IOBypass is not used after LUN Reset.
  - Root cause: A LUN reset results in disabling IOBypass in order to quiesce outstanding I/O. After reset completes, IOBypass was enabled, but the driver was not notified.
  - Fix: Notify driver when IOBypass is re-enabled.
  - Risk: Low

- Improved reporting of temperature sensor descriptors for controller virtual SES target.
  - Root cause: Firmware was reporting "vendor defined" for some of the sensors.
  - Fix: Changed to more meaningful “top” and “bottom" for descriptors.
  - Risk: Low

- Fixed a controller lockup when rekey started with IO in progress.
  - Root cause: There could be outstanding commands to a logical drive that originally had coalescing enabled, but is now disabled due to a transformation. The firmware was asserting since coalescing had been disabled but command was being processed in coalesce logic.
  - Fix: Remove the check for coalescing enabled in coalesce logic. Those commands will reach a coalesce timeout and be sent to the logical drive.
  - Risk: Low

- Fixed a controller lockup when deleting volume via PLDM over MCTP.
  - Root cause: The count for the outstanding command was being decremented too soon, causing an input validation check to fail.
  - Fix: Updated to only decrement out of band commands count if request is a non-host request. The host transport layer will decrement the count for host requests.
  - Risk: Low

- Fixed a potential controller lockup during NVMe drive firmware update.
  - Root cause: If the API call to *requery* a device for inventory purposes is sent at the same time the RAID metadata is being saved, there is a race condition exposure between the device info being cleared and the metadata update process in which a firmware assert was being hit that is checking for valid drive parameters.
  - Fix: Set a flag to indicate RAID metadata is being saved. If this flag is set, "requery" will wait until save is completed.
  - Risk: Low

- Fixed a controller lockup when removing a SMC SC846-P enclosure.
  - Root cause: SES control and status pages do not match in size. Controller allocated memory based on the status page size, but the control page was smaller in size resulting in firmware clearing select bits beyond the end of the control page that caused a lockup.
  - Fix: Authenticate size of SES control and status page. If they are not valid, do not support the SES functionality of enclosure.
  - Risk: Low

- Fixed a controller lockup 0x1BC0 during write then read I/O with UREs.
  - Root cause: A race condition could occur between two firmware threads acting on the same clean, valid cache line simultaneously. The two threads take opposing actions which cause a lockup in one thread’s checks.
  - Fix: Added a critical section within firmware so two threads can’t access the cache line simultaneously.
  - Risk: Low
2.1.2 **UEFI/Legacy BIOS Fixes**
This section shows the UEFI/Legacy BIOS fixes and enhancements for this release.

2.1.2.1 **Fixes and Enhancements for UEFI Build 1.4.6.2/Legacy BIOS Build 1.4.6.2**
This release provides the following fixes and enhancements.

- **Added new driver health error cases and messages for locked passive SED.**
  - *Root cause:* Driver health status is set as configuration required with error code 0x1902 when no devices connected.
  - *Fix:* Driver health status for 0x1902 set as healthy when no devices connected.
  - *Risk:* Low

- **Fixed an issue where the driver health state for error code 0x1902 shows configuration required when no devices connected.**
  - *Root cause:* Present 0x1942 post message is triggered as healthy even when all logical drives are offline.
  - *Fix:* After sending bypass volume command if any of logical drive state is still loose cable then treat it as abnormal volume state and set driver health state as configuration required.
  - *Risk:* Low

- **Fixed an issue where 0x1942 driver health error code displayed as healthy when the controller is in abnormal volume state where all logical drives including healthy logical drives are offline.**
  - *Root cause:* In some rare configurations, the controller can take more than 5 minutes to post. For these systems, the registry value “PostTimeOut” can be set in seconds to something greater than 5 minutes to prevent the driver from timing out during the controller post. Registry location: Per Controller—HKLM\CurrentControlSet\Enum\PCI\<Instancepath>\DeviceParameters\SmartPqi

  - *Description:* In some rare configurations, the controller can take more than 5 minutes to post. For these systems, the registry value “PostTimeOut” can be set in seconds to something greater than 5 minutes to prevent the driver from timing out during the controller post. Registry location: Per Controller—HKLM\CurrentControlSet\Enum\PCI\<Instancepath>\DeviceParameters\SmartPqi

- **Fixed an issue where there was no information in HII when the controller was in an abnormal volume state.**
  - *Root cause:* No field in HII controller information indicates that the controller is in an abnormal volume state when all logical drives are offline.
  - *Fix:* Added new display field Controller Configuration Status under Controller Information menu to represent errors in controller due to configuration.
  - *Risk:* Low

- **Fixed an issue where the erase operation on an SMR-HM physical drive fails.**
  - *Root cause:* SMR-HM drives are supported as HBA targets, but not supported for RAID configurations or erase operations by the controller firmware.
  - *Fix:* Software will not send erase commands to SMR-HM physical drives.
  - *Risk:* Low

2.1.3 **Driver Fixes**
This section shows the driver fixes and enhancements for this release.

2.1.3.1 **Windows Driver Fixes**
This section shows the Windows driver fixes and enhancements for this release.

2.1.3.1.1 **Fixes and Enhancements for Windows Driver Build 1010.24.0.1005**
This release provides the following fixes and enhancements.

- **Added support for the registry value “PostTimeOut”.** Adding this registry value allows a user to override the default controller post timeout value of 3 minutes. The valid range is 30–1800 seconds.
  - *Description:* For these systems, the registry value “PostTimeOut” can be set in seconds to something greater than 5 minutes to prevent the driver from timing out during the controller post. Registry location: Per Controller—HKLM\CurrentControlSet\Enum\PCI\<Instancepath>\DeviceParameters\SmartPqi

- **Fixed an issue where driver crashes when firmware encounters a lockup.**
  - *Root cause:* The driver is accessing the device records that are not valid while handling IOCTL because the resources are freed while the lockup is detected.
  - *Fix:* The driver will not allow the IOCTLs directed to the controller or the drives once the HBA becomes failed. Clear the target offset from the tri node if the controller is failed.
  - *Risk:* Low

- **Fixed a race condition in the driver LUN Reset handler that can result in accessing a bad pointer under heavy I/O Reset stress testing.**
2.1.3.2 Linux Driver Fixes

This section shows the Linux driver fixes and enhancements for this release.

2.1.3.2.1 Fixes and Enhancements for Linux Driver Build 2.1.16-030

This release provides the following fixes and enhancements.

• Fixed an issue where the removal of a drive from the OS could be delayed up to 30 seconds after being physically pulled.
  - **Root cause:** The driver was retrying a LUN reset three times even though the return code indicated the LUN was no longer valid. There was a 10 seconds delay between each retry. Additionally, the rescan worker was scheduled to run 10 seconds after the driver received the event.
  - **Fix:** Check the response code returned from the LUN Reset Task Management function and if it indicates the LUN is not valid, do not retry. Also, reduced the delay of the rescan worker to 5 seconds for the event handler only.
  - **Risk:** Low

• Fixed an issue where the outstanding requests and accessing the SCSI attributes for a device post linkdown leads to a hang.
  - **Root cause:** Post linkdown, driver does not fail the outstanding requests leading to long wait time before all the I/Os eventually fail. Also, access to the SCSI attributes by the host applications lead to a system hang.
  - **Fix:** Sanity check added in various functions to block the host applications from accessing the SCSI attributes of a device when the controller goes offline.
  - **Risk:** Low

• Fixed an issue of inconsistent performance in RAID 10 logical drives when performing 256K sequential reads.
  - **Root cause:** The driver was only using a single tracker to determine which physical drive to send a request to for IOBypass requests.
  - **Fix:** Allocate an array of trackers based on the number of data disks in a row of the RAID map.
  - **Risk:** Medium
Fix: Changed the units displayed by the error message back to seconds.
Risk: Low

• Fixed an issue with hibernate and suspend.
  • Root cause: PCIe Gen4 controllers have subtle differences in the way they boot. These differences were causing the hibernate/suspend code that worked on PCIe Gen3 to not work on PCIe Gen4 controllers.
  • Fix: Restructured the hibernate/suspend code to allow work-arounds for the newer boot differences so that the same code now works on both controller generations.
  • Risk: Low

• Fixed an issue of inconsistent performance in RAID 10 logical drives when performing 256K sequential reads.
  • Root cause: The driver was only using a single tracker to determine which physical drive to send a request to for IOBypass requests.
  • Fix: Allocate an array of trackers based on the number of data disks in a row of the RAID map.
  • Risk: Medium

### 2.1.3 VMware Driver Fixes

This section shows the VMware driver fixes and enhancements for this release.

#### 2.1.3.3 Fixes and Enhancements for VMware Driver Build 4252.0.103

This release provides the following fixes and enhancements.

• Fixed an issue where driver load/unload test was failing due to multiple issues with the driver error handling during initialization and topology rescan. Issues include management command timeout, memory leak, and PSOD.
  • Root cause:
    • Management command time-out: MSIX interrupts were not getting enabled when driver initialization fails after enabling legacy interrupt.
    • Memory leak: Memory allocated was not getting freed when the following step fails.
    • PSOD: Due to a page fault, memory allocation is getting failed and the return value was not getting checked correctly.
  • Fix: Corrected the error handling cases during driver initialization and rescan paths.
  • Risk: Medium

• Fixed an issue of inconsistent performance in RAID 10 logical drives when performing 256K sequential reads.
  • Root cause: The driver was only using a single tracker to determine which physical drive to send a request to for IOBypass requests.
  • Fix: Allocate an array of trackers based on the number of data disks in a row of the RAID map.
  • Risk: Medium

### 2.1.3.4 FreeBSD/Solaris Driver Fixes

This section shows the FreeBSD/Solaris driver fixes and enhancements for this release.

#### 2.1.3.4.1 Fixes and Enhancements for FreeBSD Driver Build 4210.0.1004

This release includes the following enhancements and fixes:

• Added support for 64 bit address. Changed 32 bit DMA address to 64 bit.
• Fixed an issue of inconsistent performance on RAID 10 logical drives when performing 256K sequential reads.
  • Root cause: The driver was only using a single tracker to determine which physical drive to send a request to for IOBypass requests.
  • Fix: Allocate an array of trackers based on the number of data disks in a row of the RAID map.
  • Risk: Medium

#### 2.1.3.4.2 Fixes and Enhancements for Solaris Driver Build 11.4120.0.1005

There are no fixes and enhancements for this version.

### 2.1.4 Management Software Fixes

This section shows the management software fixes and enhancements for this release.
2.1.4.1 maxView Storage Manager/ARCCONF Fixes
This section shows the maxView Storage Manager/ARCCONF fixes and enhancements for this release.

2.1.4.1.1 Fixes and Enhancements for maxView Storage Manager/ARCCONF Version 2.0.0 Build 24763
This release includes the following fixes and enhancements for ARCCONF/maxView:

• Fixed an issue where the domain authentication is not working for certain admin users in maxView.
  – Root cause: Windows APIs failed to identify the user as admin resulting in not allowing the user to perform
    admin level operation in maxView.
  – Fix: Added changes to call a new Windows API that identifies the user to be part of the admin group which
    allows them to operate in maxView.
  – Risk: Low

• Fixed an issue where ARCCONF/maxView displayed negative value in some error counters for certain hard
  drives.
  – Root cause: ARCCONF/maxView displayed the negative value for certain error counter value as it is held
    by a smaller data type.
  – Fix: Added changes to hold the error counters in relevant data types to display it correctly.
  – Risk: Low

• Fixed an issue where the user could not stop the maxView Webserver service.
  – Root cause: Conditions to stop the maxView webserver failed to allow stopping of service.
  – Fix: Added changes to allow the stopping of maxView Webserver service when relevant conditions are met.
  – Risk: Low

• Fixed an issue where maxView displays “XML Error intermitted” error.
  – Root cause: Protected view exception was not handled in maxView which resulted in the XML error.
  – Fix: Added changes to handle protected view exception in maxView.
  – Risk: Low

• Fixed an issue where ARCCONF does not display the disk name information for the hard drive.
  – Root cause: ARCCONF failed to display the disk name information for a RAW hard drive connected on a
    controller in Mixed mode.
  – Fix: Added changes to display the disk name information for a RAW hard drive on a controller in Mixed
    mode.
  – Risk: Low

• Fixed an issue where ARCCONF SETCONFIG command does not set all the controller parameters to factory
  default setting.
  – Root cause: ARCCONF SETCONFIG command does not set the controller write cache policy settings to
    default values.
  – Fix: Added changes for ARCCONF SETCONFIG command to set the controller parameters to factory
    default settings.
  – Risk: Low

• Fixed an issue where firmware logs cannot be differentiated in a multi-controller environment.
  – Root cause: In a multi-controller environment where controller’s physical slot is UNKNOWN, the firmware
    logs naming convention can differentiate where the log is collected from.
  – Fix: Added changes to add a controller ID along with the slot ID in firmware log names to identify the logs
    correctly.
  – Risk: Low

• Fixed an issue where ARCCONF failed to display the PHY error log information for an expander.
  – Root cause: Displaying expander PHY errors is disabled in ARCCONF.
  – Fix: Added changes to enable expander PHY error logs from ARCCONF.
  – Risk: Low

2.2 Limitations
This section shows the limitations for this release.
2.2.1  Firmware Limitations
This section shows the firmware limitations for this release.

2.2.1.1  Limitations for Firmware Release 3.01.09.56
There are no known limitations for this release.

2.2.2  UEFI/Legacy BIOS Limitations
This section shows the UEFI/Legacy BIOS limitations for this release.

2.2.2.1  Limitations for UEFI Build 1.4.6.2/Legacy BIOS Build 1.4.6.2
There are no known limitations for this release.

2.2.3  Driver Limitations
This section shows the driver limitations for this release.

2.2.3.1  Windows Driver Limitations
This section shows the Windows driver limitations for this release.

2.2.3.1.1  Limitations for Windows Driver Build 1010.22.0.1008
This release includes the following limitations:

- If the controller encounters a lockup and if the windows host system is restarted within 30 seconds, a BSOD might happen.
  - Workaround: If the controller encounters a lockup, restart the Windows host system after 30 seconds.
- The Windows driver issues an internal flush cache command for flushing the controller cache to the drives before changing the power state of the system (during shutdown/reboot/hibernate). Due to many factors, such as speed of drives, size of cache, type of data in cache, etc., the time taken by the controller to flush the cached data can exceed the operating system specified timeout values. A system crash can be expected in those scenarios.
  - Workaround: It is advised not to do heavy write operations on logical drives composed of slow drives while initiating a system shutdown in Windows 10 environments.

2.2.3.2  Linux Driver Limitations
This section shows the Linux driver limitations for this release.

2.2.3.2.1  Limitations for Linux Driver Build 2.1.16-030
This release includes the following limitations:

- The controller might lockup with the Inbox driver version 1.2.16-012 and RHEL 8.4 OS. The SCSI mid-layer might send requests beyond the exposed host queue depth resulting in a firmware assert.
  - Workaround: The fix for this issue has been submitted to the open source community and it is part of the latest driver version.
- When doing a driver injection (DUD) install. On some distributions (RHEL7.9, RHEL8.2, RHEL8.3, SLES15SP2, and SLES15SP3), the DUD install hangs if a drive in HBA mode has the Drive Write Cache enabled.
  - Workaround: There are two workarounds for this issue:
    - Ensure the Drive Write Cache is disabled for any drive in HBA mode.
    - For RHEL7.9, RHEL8.2, and RHEL8.3, add `rd.driver.blacklist=smartpqi` to the grub entry along with `inst.dd`.
- Due to a change in the SCSI mid-layer, some Linux distributions may take a long time to come up if the system is rebooted while a hard disk(s) is being sanitized. This has currently been observed with inbox smartPQI drivers on RHEL 7.9, RHEL 8.3, and SLES 15SP2.
  - Workaround: Do not reboot the system while a hard disk(s) is being sanitized or update to the SmartPQI 2.1.12-055 or later driver release.
- On AMD/RHEL 7.9 systems, the system might panic due to an issue in the IOMMU module. For more information, see `lore.kernel.org/linux-iommu/20191018093830.GA26328@suse.de/t`
  - Workaround: Disable the IOMMU setting option in BIOS.
- On AMD/UEK6 systems, the system might hang during kdump if IOMMU is enabled.
2.2.3 VMware Driver Limitations

This section shows VMware driver limitations for this release.

2.2.3.1 Limitations for VMware Driver Build 4252.0.103

There are no known limitations for this release.

2.2.3.4 FreeBSD/Solaris Driver Limitations

This section shows FreeBSD/Solaris driver limitations for this release.

2.2.3.4.1 Limitations for FreeBSD Driver Build 4210.0.1004

This release includes the following limitations:

- Under heavy I/O with transfer size more than 128k, controller may go offline. This happens in FreeBSD 13.
  
  - Workaround: Reduce the I/O transfer size of the application to less than 128k.

2.2.3.4.2 Limitations for Solaris Driver Build 11.4120.0.1005

There are no known limitations for this release.

2.2.4 Management Software Limitations

This section shows management software limitations for this release.

2.2.4.1 maxView Storage Manager/ARCCONF Limitations

This section shows the maxView Storage Manager/ARCCONF limitations for this release.

2.2.4.1.1 Limitations for maxView Storage Manager/ARCCONF Version 2.0.0 Build 24763

This release includes the following limitations.

- Logical drive creation fails when maxCache exists and supercap is removed.
3. **Updating the Controller Firmware**  
This section describes how to update the controller firmware to the latest release.

3.1 **Updating Controllers to Latest Firmware**  
If running firmware is 3.01.00.006 or lower, please contact Adaptec Apps team at ask.adaptec.com.

3.1.1 **Upgrading to 3.0X.XX.XXX Firmware**  
1. For controllers running 3.01.02.042 or higher firmware, flash with 3.0X.XX.XXX version of firmware "SmartFWx200.bin" provided in this package using maxview or ARCCONF utility.
2. Power cycle the server.
## Revision History

### Table 4-1. Revision History

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<th>Date</th>
<th>Description</th>
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<td>02/2022</td>
<td>VMware driver version changed from 4250.0.120 to 4252.0.103.</td>
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<tr>
<td>E</td>
<td>02/2022</td>
<td>Updated for SR 3.1.8 release.</td>
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<tr>
<td>D</td>
<td>12/2021</td>
<td>Updated for SR 3.1.6.1 release. Updated Fixes and Enhancements for maxView Storage Manager/ ARCCONF section for log4j vulnerabilities.</td>
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<td>C</td>
<td>11/2021</td>
<td>Updated for SR 3.1.6 release.</td>
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<tr>
<td>B</td>
<td>08/2021</td>
<td>Updated for SR 3.1.4 release.</td>
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<td>A</td>
<td>06/2021</td>
<td>Document created.</td>
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