

# Linux MPT SCSI OS Driver Release Notes

mptlinux-3.02.83.01

9/12/2006

## Compatibility:

- 53C1020, 53C1030
- FC909, FC919, FC929
- FC919X, FC929X, FC929XL, FC939X, FC949X, FC949ES
- SAS 1064, 1068
- SAS 1064E, 1068E, 1078

## Special Notes For This Build:

- No special notes available at this time

## Current Errata

- SLES9, and all Service Packs prior to SP2 – Driver Update Disk installs don't work when installing from CDROM attached to SAS controller. Work around is to install the OS using built-in drivers, then upgrade to newer driver using the RPM. This work around only applies to SP2, as this was the first time SAS support shipped on the distro. In addition, this issue no longer is a problem for SP3, as SP3 distro ships with split drivers, and there are no more work arounds for migrating from monolithic to split drivers, which is what broke the CDROM installation support
- The isense.ko driver
  - This driver has been removed. To enable the printing of sense data that is available in the kernel do the following:  
*sysctl -w dev.scsi.logging\_level=0x1000*
- Red Hat RHEL 4 – Driver Update Disk
  - When doing a Driver Update Disk Installation, at the first screen, enter:  
*linux dd updates*  
This replaces workaround in previous versions of the driver when running the post\_install.scr. The 'updates' signifies an anaconda update disk. This script handles copying mptctl.ko and mptlan.ko to the hard disk.
- RHEL4 Update 3 (only) – When doing an install using a Driver Update Disk, the customer will need to follow up the install by installing our Driver Update RPM
  - With Update 3, we provided split driver modules (mptspi, mptsas, mptfc). Six months ago Red Hat requested we add a new dummy driver who's purpose is to auto-load the split drivers. This dummy driver is named the same as an existing driver module called mptscsih. This new dummy driver has

broken DUD's from working properly. The problem occurs when the installer expects the dummy driver, however it doesn't exist on the floppy; e.g – we never introduced the dummy driver concept to our internal driver stream. To correct this, the object file on the DUD was renamed from mptscsih.ko to mptscsi.ko. This fixes the problem, however may introduce confusion to the end customer. To prevent future confusion, we ask customers install the driver update RPM after the installation and reboot.

- Red Hat is working to fix their issue, but it is not expected until Update 5.
- Driver Update RPM
  - When upgrading from an older to newer version of the driver, first uninstall the older RPM doing:

*rpm -e mptlinux-<version>-<os>*

Then install the new rpm doing:

*rpm -ivh mptlinux-<version>-<release>-<os>.<arch>.rpm*

The rpm -Uvh option was fixed in the 3.02.56 driver's version. This rpm option will work if oldest version driver on the system is no older than the 3.02.56 driver.

## **Driver Release Package Contents**

### **Source tarball**

Source tarball is named as:

*mptlinux-<version>-src.tar.gz*

Full driver source suitable for inclusion with any publicly available kernels. The flash utility is included in the utils/ subdirectory.

### **RPM package**

RPM images are named as:

*mptlinux-<version>-<release>-<os>.<arch>.rpm*

where:

<version>	=	version tag for this rpm
<release>	=	release tag for this rpm
<os>	=	{rhel4, sles9, sles9sp1, sles9sp2, sles9sp3, nld9}
<arch>	=	ia64 – Itanium Processor x86_64 – Opteron Processor, w/ x86_64 install i686 – i686 or later processor (Red Hat) i586 – x86 installations (SuSE)

The kernels supported are listed in the Readme\_rpms.txt included in the rpms.

## SuSE:

i686

### SLES 9

Gold (2.6.5-7.97)	(kernel-default, kernel-smp, kernel-bigsmp)
NLD9 (2.6.5-7.111)	(kernel-default, kernel-smp, kernel-bigsmp)
SP1 (2.6.5-7.139)	(kernel-default, kernel-smp, kernel-bigsmp)
SP2 (2.6.5-7.191)	(kernel-default, kernel-smp, kernel-bigsmp)
SP3 (2.6.5-7.244)	(kernel-default, kernel-smp, kernel-bigsmp)

x86\_64

### SLES9

Gold (2.6.5-7.97)	(kernel-default, kernel-smp)
SP1 (2.6.5-7.139)	(kernel-default, kernel-smp)
SP2 (2.6.5-7.191)	(kernel-default, kernel-smp)
SP3 (2.6.5-7.244)	(kernel-default, kernel-smp)

ia64

### SLES9

Gold (2.6.5-7.97)	(kernel-default, kernel-64k-pagesize, kernel-sn2)
SP1 (2.6.5-7.139)	(kernel-default, kernel-64k-pagesize, kernel-sn2)
SP2 (2.6.5-7.191)	(kernel-default, kernel-64k-pagesize, kernel-sn2)
SP3 (2.6.5-7.244)	(kernel-default, kernel-64k-pagesize, kernel-sn2)

## RedHat:

i686

### RHEL4

Gold (2.6.9-5.EL)	(normal, BOOT, hugemem, smp)
U1 (2.6.9-11.EL)	(normal, BOOT, hugemem, smp)
U2 (2.6.9-22.EL)	(normal, BOOT, hugemem, smp)
U3 (2.6.9-34.EL)	(normal, BOOT, hugemem, smp)

x86\_64

### RHEL4

Gold (2.6.9-5.EL)	(normal, smp)
U1 (2.6.9-11.EL)	(normal, smp)
U2 (2.6.9-22.EL)	(normal, smp)
U3 (2.6.9-34.EL)	(normal, smp, largesmp)

ia64

### RHEL4

Gold (2.6.9-5.EL)	(normal)
U1 (2.6.9-11.EL)	(normal)
U2 (2.6.9-22.EL)	(normal)
U3 (2.6.9-34.EL)	(normal, largesmp)

## Major Changes For Version 3.02.83.01

Release Date: 9/12/2006

### General Changes

#### Functionality

- None

#### Defect fixes

- **Issue:** SAS Address of pulled drive that is part of an IR volume is all zero's in the data returned from CSMI GET\_RAID\_CONFIG ioctl call

**Reported by:** Customer

**To Reproduce:** Create an IM/IS volume and pull out one of the drives in the volume. Using csmitest tool issue

CC\_CSMI\_SAS\_GET\_RAID\_CONFIG call to display Drives information and note the SAS Address field of the drive that was pulled is all zero's

**Description of Change:** Changed code to NOT update the SAS address list when a drive that is part of a volume is pulled/inserted

- **Issue:** Hot spare drive (of same drive type as that of drive in volume) is listed as member of an IS (RAID 0) volume when CSMI GET\_RAID\_CONFIG ioctl call is issued

**Reported by:** Customer

**To Reproduce:** Create a 2 drive IM volume with a hot spare and a 2 drive IS volume all of the same drive type. Using csmitest tool, issue CC\_CSMI\_SAS\_GET\_RAID\_CONFIG call to display Drives information and note that the hot spare drive is also listed as member of the IS volume

**Description of Change:** Added a check for IS volume type and ignored while trying to add a hot spare drive as a member of the volume

## Major Changes For Version 3.02.83

Release Date: 8/04/2006

### General Changes

#### Functionality

- None

#### Defect fixes

- **Issue:** SAS Address of hot spare drive is all zero's in the data returned from CSMI GET\_RAID\_CONFIG ioctl call  
**Reported by:** Customer  
**To Reproduce:** Create an IM volume with a hot spare drive and using csmitest tool issue CC\_CSMI\_SAS\_GET\_RAID\_CONFIG call to display Drives information and note the SAS Address field for the hot spare drive  
**Description of Change:** Moved memset of buffer before filling in SAS Address for a hot spare drive
- **Issue:** uChangeCount field in CSMI ioctl is being incremented for all RAID actions and phys disk status changes for non-SAS controllers too  
**Reported by:** Developer  
**To Reproduce:** Attach a 1030 SCSI controller and create and delete a volume. Run the csmitest tool to display fields in GET\_RAID\_INFO ioctl and notice that Change Count value is incremented which should reflect the change count events only for SAS controllers  
**Description of Change:** Moved incrementing csmi\_change\_count from mptbase to mptsas so it is confined to changes to SAS events
- **Issue:** Some of the fields returned by GET\_RAID\_CONFIG CSMI ioctl call are not filled-in or returns default values for hot spare drives  
**Reported by:** Developer

**To Reproduce:** Create an IM volume with a hot spare drive and using csmitest tool issue CC\_CSMI\_SAS\_GET\_RAID\_CONFIG call to display Drives information and note that usBlockSize, uDriveIndex are returned zero and bDriveType is returned UNKNOWN

**Description of Change:** Filled in usBlockSize, uDriveIndex, and bDriveType fields for hot spare drives in GET\_RAID\_CONFIG ioctl

## **Major Changes For Version 3.02.82**

**Release Date:** 7/25/2006

### **General Changes**

#### **Functionality**

- Implemented following CSMI 0.90 Phase I and II changes and additional features:
  - CSMI\_SAS\_GET\_CNTLRL\_CONFIG - updated uControllerFlags
  - CSMI\_SAS\_GET\_RAID\_INFO - updated uMaxDriverPerSet and implemented new fields
  - CSMI\_SAS\_GET\_RAID\_CONFIG - updated bDriveCount, bStatus, bInformation, union.Drives and implemented new fields
  - CSMI\_SAS\_GET\_RAID\_FEATURES - new IOCTL
  - CSMI\_SAS\_GET\_RAID\_CONTROL - new IOCTL
- Updated CSMI\_SAS\_GET\_CONNECTOR\_INFO ioctl by filling in data from Manufacturing Page 7

#### **Defect fixes**

- **Issue:** mptsas and mptctl drivers not automatically loaded when SAS1078 controller is installed on either RHEL or SLES systems

**Reported by:** Developer

**To Reproduce:** Install a SAS1078 card on RHEL or SLES and upgrade the driver using DUD or RPM installation. On loading the OS, the mptsas and mptctl modules are not loaded automatically



**Description of Change:** The Device Id for SAS1078 has been updated from 0x60 to 0x62 in fusion.mptctl, update.kernel and suse-install.sh scripts that is packaged in RPM and DUD images for both RHEL and SLES, as well as in DKMS package

## **Major Changes For Version 3.02.81**

**Release Date:** 7/20/2006

### **General Changes**

#### **Functionality**

- None

#### **Defect fixes**

- **Issue:** A kernel panic occurs during Domain Validation to physical drives in a Raid volume on drives attached to a 1030.

**Reported by:** Customer.

**To Reproduce:** Run version 3.02.80. Have drives configured as a Raid volume and attached to a 1030. Domain Validation occurs when driver module mptspi is loaded and a panic occurs in routine mptscsih\_doDv.

**Description of Change:** A NULL pointer was being used when checking if the drive is part of a Raid volume. A check for a NULL pointer has been inserted before it is used.

An additional change has been made in mptscsi\_qas\_check to send the proper negotiation parameters to Raid Volume drives rather than Async, Narrow if QAS support is not allowed on the bus (mixed QAS and non-QAS devices are present or they have been throttled back to Ultra 160 or slower speeds via the Configuration Utility).

## **Major Changes For Version 3.02.80**

**Release Date:** 7/7/2006

## **General Changes**

### **Functionality**

- None

### **Defect fixes**

- **Issue:** A kernel panic occurs with SLES 9 when the driver modules are unloaded.

**Reported by:** Customer.

**To Reproduce:** Run version 3.02.79 with SLES 9. Have devices attached to a 1030 where the boot device is not attached to any 1030 HBAs. Issue "rmmod mptspi".

**Description of Change:** The call to routine scsi\_host\_remove was replaced with a loop through all the devices attached to the IOC, calling routine scsi\_remove\_device. This removes the device entries in /proc/scsi/scsi, sg\_map and lsscsi for that IOC. A Bugzilla has been generated with SuSE but no response has been received at this time.

## **Major Changes For Version 3.02.79**

**Release Date:** 6/21/2006

## **General Changes**

### **Functionality**

- During device discovery, in routine mptsas\_scan\_target, a loop has been added to send a Test Unit Ready command to the device every second until the device responds with a good status. A command line parameter, mpt\_cmd\_retry\_count, is available to control the number of loop iterations, with the default set to 60. Once a good status is received or the loop is exhausted, a Report Luns command is sent (this may be done up to 10 times with a 1 second interval

until a good status is received). This is done to ensure certain Raid controllers are on-line and have their devices available.

### Defect fixes

- **Issue:** If MaxDevices reported by a PortFacts request is not a multiple of 256, the NumberOf Buses is off by one, due to rounding down of the calculation. For example, if MaxDevices is reported to be 500, the NumberOfBuses would be 1 rather than the expected 2.

**Reported by:** Development

**To Reproduce:** Run version 3.02.77 with FW that reports MaxDevices that is not a multiple of 256 (FC FW does that). With MPT\_DEBUG\_INIT compiled in, the NumberOf Buses will be one short of the expected.

**Description of Change:** Code was changed to round up the NumberOfBuses calculation, allowing for an additional bus allowing for the extra number of devices that is greater than the multiple of 256. In the example above, the NumberOfBuses is 2.

- **Issue:** Routine mptscsih\_writeFCPortPage3 always writes with bus=1.

**Noticed by:** Development

**To Reproduce:** Run 3.02.77 with a FC HBA and FC devices attached.

**Description of Change:** An additional parameter, bus, was added to the routine and the routine calls. This values is used to write the proper bus value.

- **Issue:** A panic occurs if a Target only mpt HBA is in the system and Isiutil is executed for IOCInfo.

**Reported by:** Development

**To Reproduce:** Run version 3.02.77 with a Target only mpt HBA and execute GetIOCInfo.

**Description of Change:** Code was added in mptctl to ensure the Target\_List pointer is not NULL, as it is with a Target only HBA.

## Major Changes For Version 3.02.77

Release Date: 6/14/2006

### General Changes

#### Functionality

- Added check for IOC Status from Task Management Reply Message and return FAILURE to SCSI mid-layer on all Task Management call back functions. A FAILURE is returned when IOC Status returned by Firmware is not MPI\_IOCSTATUS\_SUCCESS

#### Defect fixes

- **Issue:** Panic occurs when creating an IME Raid Volume immediately after deleting all Raid Volumes using the cfggen utility.

**Reported by:** Test Team

**To Reproduce:** Establish an IME Raid Volume with drives attached to a SAS HBA. Reboot the system. Have the cfggen utility installed and execute:

cfggen <HBA Number> delete noprompt

cfggen <HBA Number> create ime max <disk drive numbers of prior volume> noprompt

Panic occurs but nothing is displayed on console screen; two lights are blinking.

**Description of Change:** Code was changed to prevent use of invalid pointer in interrupt routine.

- **Issue:** NumberOfBuses calculation was incorrect and was not reported to the scsi mid-layer.

**Reported by:** Developer.

**To Reproduce:** Using a SAS HBA with FW that supports 1024 devices, enable MPT\_DEBUG\_INIT, compile and load the driver modules. Examine the dmesg output when mptsas is loaded. The NumberOfBuses is set to 1 and no buses other than bus 0 is scanned in mptsas\_slave\_alloc.

**Description of Change:** Code was changed to correctly calculate the NumberOfBuses from the PortFacts MaxDevices and the DevicesPerBus. Code was changed to set the scsi mid-layer max\_channels to NumberOfBuses. This causes logical buses 0, 1, 2 and 3 to be scanned for devices if the MaxDevices is 1024, as is the case for this FW.

- **Issue:** System crashes caused by doubly-completing a SCSI command.

**Reported by:** Customer.

**To Reproduce:** Bad FC cables cause CRC errors and lost SCSI commands. These commands time out and the mid-layer attempts to abort them. If the abort times out, FC firmware will complete the abort with failure status, but the driver was not checking – it was looking only for the abort to complete. When the abort finishes, the mid-layer completes the outstanding SCSI command, while unfortunately the firmware continues to work on it, and might complete it later itself. If this happens, the driver will complete the SCSI command a second time, and the system will typically crash.

**Description of Change:** Keep track of the message frame assigned to a SCSI command (using the host\_scribble field). Validate this field before completing any SCSI command. When aborting a SCSI command, check to see if it's still outstanding when the abort completes from the firmware, and if so, fail the abort to the mid-layer (If the mid-layer sees the abort fail, it will not complete that SCSI command)

## **Major Changes For Version 3.02.74**

**Release Date:** 5/31/2006

## **General Changes**

## **Functionality**

- The capability of having 1024 devices attached to single SAS controller has been implemented. These devices can be allocated to four buses with up to 256 devices per bus. The driver will obtain the actual number of buses and devices per bus and that information will be provided to the scsi midlayer during initialization. A device discovery scan over those buses and id's will occur. Normal IOs will occur, since all IO requests contain a bus and id uniquely identifying each device on a particular HBA channel.
- Revoked all CSMI 0.89 changes back to CSMI 0.83. CSMI 0.89 is not backward compatible to previous versions

## **Defect fixes**

- None

## **Major Changes For Version 3.02.73**

**Release Date: 5/22/2006**

## **General Changes**

### **Functionality**

- Implemented following CSMI 0.89 Phase II changes and additional features:
  - CSMI\_SAS\_GET\_CNTLRL\_CONFIG - updated uControllerFlags
  - CSMI\_SAS\_GET\_RAID\_INFO - updated uMaxDriverPerSet and implemented new fields
  - CSMI\_SAS\_GET\_RAID\_CONFIG - updated bDriveCount, bStatus, bInformation, union.Drives and implemented new fields
  - CSMI\_SAS\_GET\_RAID\_FEATURES - new IOCTL
  - CSMI\_SAS\_GET\_RAID\_CONTROL - new IOCTL

### **Defect fixes**

- **Issue:** Hang condition during SAS cable pull case

**Reported by:** Customer

**To Reproduce:** Run IO to mounted partition

**Description of Change:** Target Reset in slave\_destroy entry was causing the hang. To fix, we moved the target reset to hotplug\_work threads. Also inhibit IO to end device once device is known to be removed.

- **Issue:** Port down retry situation is not returning DID\_BUS\_BUSY during SAS cable pull case

**Reported by:** Customer

**To Reproduce:** Pull cable.

**Description of Change:** The msb of the ioc status was being overwritten with zero during the masking of the register.

- **Issue:** Luns greater than zero ignored during cable push case

**Reported by:** Customer

**To Reproduce:** Cable push to end device having more than one lun

**Description of Change:** The isRaid field in the mptsas\_hotplug\_event structure was not being initialized, thus garbage was there, and the incorrect path was taken in the hotplug\_work thread which resulted in REPORT\_LUNS not being called.

## **Major Changes For Version 3.02.71**

**Release Date:** 4/19/2006

## **General Changes**

### **Functionality**

- Added Hot Plug support for Multi-LUN devices
- Added Tape TLR support
- Added RHEL 4 U3 support – kernel 2.6.9–34

### **Defect fixes**

- None

## **Major Changes For Version 3.02.69**

**Release Date: 4/11/2006**

### **General Changes**

#### **Functionality**

- If a Raid Volume contains SATA drives, the CSMI IOCTL that requests the Serial number has been changed to include 4 bytes of data from the ExtDiskIdentifier field, producing a total of 20 bytes of data, including the 16 bytes of data from the DiskIdentifier field. If the drives are not SATA drives, the 16 bytes of data in the DiskIdentifier field is provided.
- If the LogInfo field in an IOC\_TERMINATED reply indicates NEXUS\_LOSS, a DID\_BUS\_BUSY result is returned to the scsi mid-layer. This causes a retry of the command.
- The 1.05.13 MPI Header files are used with this driver.
- Support for the 1035, 1066 and 1066E chips has been removed, since those chips are not going to be released to customers.

#### **Defect fixes**

- None.

## **Major Changes For Version 3.02.68**

**Release Date: 3/30/2006**

### **General Changes**

#### **Functionality**

- A command-line parameter, mpt\_gas\_disable, has been added to the mptspi module. Turning on this parameter disables QAS



in all Ultra 320 negotiations. The default is for QAS to be included in all Ultra 320 negotiations, if all devices on the SCSI bus operate at Ultra 320.

- Routine mptctl\_open has been added and the routine has been added to the mptctl\_fops structure. The routine simply returns a zero value.

### **Defect fixes**

- **Issue:** Panic when power is turned off to a SAS device during IOs.

**Reported by:** Test Team.

**To Reproduce:** Start an IO stream to a SAS tape drive; power down the tape drive.

**Description of Change:** When a SAS event indicates a device is not responding (ReasonCode=MPI\_EVENT\_SAS\_DEV\_STAT\_RC\_NOT\_RESPONDING), routine mptsas\_hotplug\_work is scheduled to perform the hotplug device removal. That routine was modified to:

Issue a Task Management Target Reset

Execute scsi\_remove\_device

Execute scsi\_device\_put

The Task Management Target Reset causes the SAS Firmware to return all outstanding commands that are present at the Firmware to be returned with an IOCStatus of IOC\_TERMINATED, causing the driver to return those commands to the scsi mid-layer with an error status. Prior to this version, the Task Management Target Reset was being done after the device had been removed at the scsi mid-layer by scsi\_remove\_device, causing a panic when outstanding commands are returned to the scsi mid-layer.

- Routine mptscsi\_remove has been modified to eliminate a panic when module mptspi is unloaded in a SLES 9 system. The scsi\_remove\_host routine call was replaced, for each attached target, with:
  - 1) A Task Management Target Reset, to clear all outstanding commands in the Firmware.

- 2) A scsi\_remove\_device call.
- 3) A scsi\_device\_put call.
- **Issue:** Domain Validation may not be performed when a device is added.

**Reported by:** Developer.

**To Reproduce:** Power on a device and access it. Observe Domain Validation IOs.

**Description of Change:** Code that set a flag indicating valid Inquiry data has been received in routine mptscsi\_slave\_alloc has been removed. This allows Domain Validation to be performed when the added device is accessed.

## **Major Changes For Version 3.02.66**

**Release Date:** 3/15/2006

## **General Changes**

### **Functionality**

- SAS Hot Plug support has been added.

### **Defect fixes**

- **Issue:** Hang condition when Ultra 80 drive is used in an OEM's enclosure.

**Reported by:** Customer

**To Reproduce:** Bring system up with that drive and enclosure.

**Description of Change:** If the initial Inquiry data received is less than 57 bytes, the drive is assumed to not be capable of Ultra 160 or Ultra 320 speeds. Domain Validation will start with Ultra 80 (WDTR, SDTR) unless throttled further by NvRam data. This prevents a hang condition when Ultra 2 drives are used in one OEM's enclosure.

## **Major Changes For Version 3.02.65**

**Release Date:** 3/15/2006

## General Changes

### Functionality

- Support for SAS Enclosures with SMART drives for a particular OEM has been added.

### Defect fixes

- None.

## Major Changes For Version 3.02.64

Release Date: 3/15/2006

## General Changes

### Functionality

- SAS 1078 support has been added.

### Defect fixes

- None.

## Major Changes For Version 3.02.63.01

Release Date: 2/24/2006

## General Changes

### Functionality

- None

### Defect fixes

- Issue: Offensive comments, code.  
Reported by: IBM.  
To Reproduce: View the driver source code and application files.

**Description of Change:** The code base has been sanitized, removing as many references to particular OEM customers as is practical. Also an offensive panic in one of the mptlan.c routines has been replaced with a more definitive print statement and a return with error indication.

- **Issue:** Onboard 1030 Channel B reset fails.

**Reported by:** Developer.

**To Reproduce:** Use Isiutil to reset Channel B of Onboard 1030.

**Description of Changes:** A Firmware downloadboot will be included when either channel of an onboard 1030 is reset. This is necessary in order for the onboard 1030 to become operational.

- The code that checks for the necessity for a Firmware downloadboot when a chip is reset was not verifying if the HBA was a single channel adapter. This caused a panic when a SAS HBA is reset via a Isiutil request. This check has been added.

## **Major Changes For Version 03.02.63**

**Release Date:** 12/21/2005

## **General Changes**

### **Functionality**

- Added SuSE SP3 Support – 2.6.9–7.244
- Added SuSE NLD9 Support – 2.6.9–7.111 (only i568)
- Added debug messages for new firmware asynchronous events: MPI\_EVENT\_IR\_RESYNC\_UPDATE, MPI\_EVENT\_IR2, MPI\_EVENT\_SAS\_DISCOVERY, MPI\_EVENT\_LOG\_ENTRY\_ADDED
- Service Script `fusion.mptctl` used for loading the mptctl driver, has been modified so the ioctl driver is always first to be loaded, and last to be unloaded.
- Source RPM has a couple suggested changes from a customer.

## Defect fixes

- SuSE Driver Update Disks – added support for USB Floppy and USB CDROM – handles issues with drive letter assignments so the USB devices obtain drive letter assignments after mpt fusion.
- Fix in dkms kit. A change in the dkms.conf to fix problem where not all the scsi llds were included in the ramdisk image, and rebooting resulted in a panic.
- **Issue:** SPI/53C1030 panic  
**Reported by:** Testing.  
**To Reproduce:** Install using Driver Update Disk, results in driver not loading.  
**Description of Change:** The fix is to write 'MPI\_HIM\_DIM' to the Host Interrupt Mask register, when enabling interrupts. Apparently in previous release of driver, writing a '0' to the HIM, was incorrect, as the doorbell interrupts were enabled. The ISR doesn't properly handling this type of interrupt, thus we need to mask this.
- **Issue:** SPI/53C1030 panic and freezes.  
**Reported by:** Customer.  
**To Reproduce:** Install SuSE SLES9 SP2 onto RAID1 volume. Install customer's application. Pull drive, and reinsert. Mirror then is resyncing. In time, the system will freeze.  
**Description of Change:** The ioctl driver stack is using wait\_event\_interruptible\_timeout(), for waiting on firmware request to complete. It appears that sometimes we are getting control back from this function before the application actually completed this command, thus resulting in the returning of stale data back to the application. It's believed the application is using signals for inter thread communication, thus resulting in the problem. The fix is to using wait\_event\_timeout(), which will not be interrupted by outside signals.
- **Issue:** SPI/53C1030 driver hang when unloading the driver for a flash less controller.

**Reported by:** Testing.

**To Reproduce:** Unload the driver when the controller is an embedded controller with no flash.

**Description of Change:** When unloading the driver, the downloading of firmware to flash has changed from download to the first ioc, to downloading to the second ioc. Apparently the driver hang is due to SYNCHRONIZE\_CACHE being sent to devices on the 2<sup>nd</sup> ioc after the first ioc had downloaded the firmware.

## **Major Changes For Version 03.02.62**

**Release Date:** 11/28/2005

### **General Changes**

#### **Functionality**

- Change in slave\_destroy – target reset issued when devices are being removed is changed so only devices detected from the slave\_configure entry point will have a target reset issued.
- DV poor performance – another fix (look at 3.02.61 release notes). The synchronization between alt\_ioc bringup and domain validation is moved around mptscsih\_doDv; because config pages which issue negotiation could fail due to alt\_ioc bringup.

#### **Defect fixes**

- **Issue:** SAS PCI Express HBA's don't work.

**Reported by:** Customer.

**To Reproduce:** Loading the driver with an appropriate SAS card having PCI Express, would result in error recovery.

**Description of Change:** Root caused to lost interrupts. The fix is to write '0' to the Host Interrupt Mask register, when enabling interrupts. Apparently writing '1's to some of the reserved bits was causing problems with lost interrupts.

## Major Changes For Version 03.02.61

Release Date: 11/16/2005

### General Changes

#### Functionality

- Change bus\_type = SCSI, to SPI
- Added "module=THIS\_MODULE" in mptfc/mptsas/mptspi – scsi\_host\_template, so the driver will not unload when a device handle is opened
- Proper handling of return error codes in probe functions for mptfc/mptsas/mptspi
- flush the hot plug work queue when the mptsas driver unloads
- DATA OVERRUN replies will report good status and resid = 0. This allows wide SCSI tape drives negotiated at Ultra 80 or slower to operate properly when an odd number of data bytes are requested

#### Defect fixes

- **Issue:** panic – when calling ioctl HP\_GETHOSTINFO  
**Reported by:** Customer.  
**To Reproduce:** This ioctl calls toolbox f/w call to gather the backplane info for HP. The interrupt handler was accessing a NULL pointer, thus resulted in panic.  
**Description of Change:** A rewrite of the code to use the existing wait\_event\_interruptible\_timeout() mechanism that is there in mptctl. The old toolbox code is deleted.
- **Issue:** poor performance on Ultra 320 controllers, 1030, 1020A, 1020

**Reported by:** People from the linux community.

**To Reproduce:** Domain Validation is failing to negotiate better than asyn-narrow speeds. Domain Validation is done thru work queue spawned in thread. The problem occurs when the thread on the first channel is still running when the second channel is being initialized. When the 2nd channel is brought up, the Domain Validation on the other channel is killed.

**Description of Change:** Add synchronization between domain validation thread and initialization of controller. This is done by using spin\_lock called initializing\_hba\_lock.

## **Major Changes For Version 03.02.60**

**Release Date:** 10/26/2005

## **General Changes**

### **Functionality**

- Red Hat RHEL4 Update 2 –support added in RPMs and Driver Update Disks.
- DKMS – Combined RedHat and SuSE into single RPM.
- Added service script that will auto load the mptctl driver at boot time. This driver is a character driver which handles the IOCTLS. This is added to RPM's (binary and DKMS), and SuSE Driver Update Disks. This was not added to RHEL4 series Driver Update disks.
- lsiutil version 1.40 update.
- mpt\_get\_msg\_frame() – this function is used for obtaining a message frame. With this release, the failure of this call will be using the dfailprintk mask debug option. This will improve debugging this particular failure case. Its enabled by uncomment `EXTRA\_CFLAGS += -DMPT\_DEBUG\_FAIL` in the driver makefile, and re-compiling the driver.



- Increased port enable timeout for SAS(both IR and IT Firmware's) to 300 seconds.

## Defect fixes

- **Issue:** CSMI IOCTL get\_raid\_config – mixing sata and sas hot spares assigned to raid volumes shouldn't be allowed.

**Reported by:** Customer.

**To Reproduce:** Create a RAID volume. A SATA hot spare should be assigned only to SATA volumes, and SAS hot spares should be assigned only to SAS volumes.

**Description of Change:** The device type is checked when assigning hot spares to active raid volumes. Also capacity check was added to insure the hot spares are large enough to fit into its assigned raid volume.

- **Issue:** Adding/Removing SAS devices could result in a panic.

**Reported by:** Internal Test Labs.

**To Reproduce:** Hot adding/removing many devices(at least 4), or turning power on/off many times, could result in panic. This can be reproduced as well by creating/deleting raid volumes.

**Description of Change:** Adding a semaphore around the hot plug thread. It seems this thread was being re-entered causing a device link list to become corrupted.

- **Issue:** Panic unloading driver – FC949.

**Reported by:** Customer.

**To Reproduce:** The panic occurs during unloading the driver. When the first channel has been unloaded, the 2<sup>nd</sup> channel is trying to be freed, but wait, a host reset occurs, then there is panic. This driver fix's the panic, not the host reset.

**Description of Change:** There is a pointer in the per host adapter data area that points to the other channel per host adapter data area. This pointer is called ioc->alt\_ioc. Its used so one channel can see the other channel data configuration. The panic occurs because this pointer was not reset back to zero when the first

channel was freed during driver unload time. When the 2<sup>nd</sup> channel begins to be unloaded, a host reset occurred for some reason. IN the host reset code, it was accessing the ioc->alt\_ioc pointer which now is invalid pointer since the other channel has already unloaded. The fix is to set those pointers to zero when a respective channel has unloaded.

- **Issue:** CSMI IOCTL get\_location – memory leak  
**Reported by:** Developer  
**To Reproduce:** N/A  
**Description of Change:** Several exit path's in this ioctl were not properly cleaning up the freeing of allocated memory.

## **Major Changes For Version 03.02.59**

**Release Date:** 09/29/2005

## **General Changes**

### **Functionality**

- CSMI ioctls – Timeout values are honored by the application timeout value, which is sent by the ioctl header. Previously the driver was hard coding a 10 second timeout.
- Add command line option “mpt\_sas\_hot\_plug\_enable”. This will allow the end user to disable hot swap support for when “SCSI devices are not responding”. Hot swap support for “SCSI devices being added”, is not affected by this change.
- The power management suspend function – the definition of the input parameter called “state” has changed in the 2.6.12 kernel; this driver adds support for this change so the driver can compile in the newer kernels.
- CSMI Phase III support – modifications are added in both driver and hptest application. Support was added in sas\_phy\_control, which allows link rate change, disabling/enabling phys, and

returning default phy settings. Support was also added in sas\_get\_location which returns locate array info for raid volumes. Using the updated hptest provided in the driver source, one can validate these changes. The hptest tool selection items 18 and 19 will test these updated ioctls.

### **Defect fixes**

- **Issue:** CSMI IOCTL get\_raid\_config – driver was not recognizing smart errors for hot spares.

**Reported by:** Customer.

**To Reproduce:** Create a RAID volume, attach a hot spare with known smart error. Then use the hptest application provided in driver source to verify that the hotspare drive status has been set to CSMI\_SAS\_DRIVE\_STATUS\_DEGRADED, instead of CSMI\_SAS\_DRIVE\_STATUS\_OK.

**Description of Change:** Check SAS Phys disk Page 0 for Smart Errors, then for Hot Spare return “degraded” drive state.

- **Issue:** Panic in mptlan driver during any type of error recovery; as long as there are no Fibre Channels controllers present in configuration.

**Reported by:** Developer test.

**To Reproduce:** Using “sg\_reset -h /dev/sg0” will replicate this issue as long as mptlan.ko is loaded, ( there are no Fibre Channel controllers present).

**Description of Change:** When there are no Fibre Channel Controllers present in the configuration, and when mptlan.ko is loaded, the net\_device instance will not be created. If the error handling entry point is called, the driver was not checking whether the net\_device pointer was a NULL pointer.

### **Major Changes For Version 03.02.58**

**Release Date:** 09/08/2005

## Driver General Changes

### Functionality

- MPI Headers v1.05.12 upgrade

### Defect fixes

- IR Performance fix – The performance problem is due to a fix made in the 3.02.16 driver, where a target reset was added in mptscsih\_slave\_destroy() function. This target reset would be killing domain validation on hidden physical disks in a raid volume, resulting in some disks to negotiate at 2MB/s ( async narrow speeds). The fix is to only prevent the target reset for SPI, and disk hidden in a raid volume. The previous fix made in 3.02.16 is not backed out for FC and SAS, as well as SPI for disks not members of raid volumes.

## Major Changes For Version 03.02.57

Release Date: 08/26/2005

## Driver General Changes

### Functionality

- Verbose kernel messages for Integrated RAID events.

### Defect fixes

- Mptlan – Fix for the Lan driver. In the interrupt handler, message frames were not being freed in certain circumstances.
- Fix for ioctl= MPTEVENTQUERY. The event log size was returning '0' instead of '50', when driver first loaded. Previously the driver would only initialize the event log size after ioctl=MPTEVENTENABLE was called.

- Fix for Asyn event notification logic. The aen\_event\_read\_flag was never getting turned on when SIGIO event was raised. This flag is used to inhibit SIGIO notification between reading the event log.
- Fix for CSMI get\_raid\_config\_info. This fix involves recognizing smart errors, and marking a drive as degraded when smart errors are detected.

## **Major Changes For Version 03.02.56**

**Release Date: 08/18/2005**

## **Driver General Changes**

### **Functionality**

- MPI Headers v1.05.11 upgrade
- The function mpt\_interrupt is split into two separate functions, for cleaner readable code. This requested by patch on linux-scsi@ mailing list

### **Defect fixes**

- Fix 'oops' when loading mptctl.ko, with initiator mode disabled. This fix in SCSI LLD probe routines, when in initiator mode, the routine was returning a failure code = -ENODEV. When the probe routine returned a failure code, the pcidev->driver pointer was not initialized, thus causing a 'oops' later when mptctl.ko registered itself to mptbase.ko
- CSMI - Get Raid Config - Fix for setting Phys Disk to REBUILDING state when the volume was being resyn'ed.
- Several build environment RPM fixes. The rpm was not properly handling rpm -Uvh upgrade, which is when upgrading from an older to newer version driver. Also fix problem with driver loading order in ramdisk image, so drive mapping is conserved

when other scsi controllers are listed in the initrd configuration files.

## **Major Changes For Version 03.02.55**

**Release Date:** 08/05/2005

### **Driver General Changes**

#### **Functionality**

- CSMI – CC\_CSMI\_SAS\_SSP\_PASSTHRU and CC\_CSMI\_SAS\_STP\_PASSTHRU – remove the quiece io surrounding raid passthru request.

#### **Defect fixes**

- CSMI – CC\_CSMI\_SAS\_SSP\_PASSTHRU, CC\_CSMI\_SAS\_STP\_PASSTHRU – add check in code to insure that driver doesn't write beyond user space when returning data for scsi passthru request.
- CSMI – CC\_CSMI\_GET\_RAID\_CONFIG – Initialize the bDriveCount field to zero. In some cases the application was sending a non-zero value, and the driver incremented the drive count assuming bDriveCount was zero. Thus if bDriveCount was non-zero, the driver would report more drives in raid volume than actually existed

- CSMI - CC\_CSMI\_GET\_RAID\_CONFIG - The application was sending a buffer size larger than what was actually allocated by the application. The driver would overwrite the entire buffer when data was returned to user space. When the application freed the memory allocated for this transaction, the application would crash.
- CSMI - CC\_CSMI\_GET\_RAID\_CONFIG - Fix a panic in the driver when divide by zero occurred. This occurred due to firmware falsely reporting that raid1 volume was re-syncing. The driver was calculating the rebuilding rate expecting the divisor to be non-zero value, thus resulting in the panic.

## **Major Changes For Version 03.02.54**

**Release Date: 07/22/2005**

## **Driver General Changes**

### **Functionality**

- Isitutil v1.38 - update
- Added pci id support for FC949ES
- CSMI support compiled in for RHEL4
- Added SLES9 SP2 support. Details follows.
- SLES9 SP2 Support: msleep was changed to msleep\_compat, and msleep\_interruptible changed to msleep\_interruptible\_compat. The msleep API was a backported to SLES9 SP2, thus we had to change this to compat from linux-compat.h. Also both msleep and msleep\_interruptible implementation was updated to 2.6.13 kernel implementation.
- Some backports from kernel.org - from 2.6.11, 2.6.12, and 2.6.13 kernels - Details follows:
- Backports: eh thread are now called with interrupts enabled
- Backports: mptscsih\_shutdown - change parameters being passed - from device to pci\_dev

- Backports: ioctls – interface changes – x86\_64 compatibility for 32 apps
- Backports: change\_queue\_depth API – added new sysfs attribute
- Backports: mptscsih\_suspend – change to parameters being passed – from u32 to pm\_message\_t
- Kconfig – added `default m` so the new modules {mptspi, mptfc, mptsas} are compiled as modules by default

### **Defect fixes**

- endian fix's thru out code, but mostly in ioctls
- csmi ssp\_passthru and stp\_passthru – check to see if there is data transfer to device. If there is not going to be data transfer, then eliminate the need to allocate memory with zero data length.
- csmi ssp\_passthru and stp\_passthru – remove the commented code for quiescing io. This was commented out in previous 3.02.53. There has been a fix for this in the 4.01+ firmware for thus.
- csmi get\_raid\_info – max drives per set was returning 0 when there were no volumes created. This release will always return valid data for this member even if there are no volumes. Typical value for this is 10.
- Remove scsi\_device\_online from linux-compat.h, as well as from mptscsih\_flush\_running\_cmds(). This check if device is online is no longer needed as eh\_threads in the driver are more robust, and task management request will be completed in the contents of the eh handlers. Before we were using timers in the driver, and it was possible that scsi-mid layer would offline devices before the host reset.

### **Major Changes For Version 03.02.53**

**Release Date: 07/07/2005**



## **Driver General Changes**

### **Functionality**

- MPI Headers v1.5.10 update
- lsitutil v1.37 – update
- mptutil v00.00.06 – update
- CSMI initial implementation – CC\_CSMI\_SAS\_GET\_LOCATION
- CSMI initial implementation – CC\_CSMI\_SAS\_PHY\_CONTROL
- CSMI initial implementation –  
CC\_CSMI\_SAS\_GET\_CONNECTOR\_INFO

### **Defect fixes**

- Added Steve Shirron's SCSI\_RESIDUAL\_MISMATCH data corruption fix.
- Changed MPT\_IOCTL\_INTERFACE\_SAS from (2) to (3). This is used in the ioctl path, and returned in GET\_IOC\_INFO.
- CSMI – CC\_CSMI\_SAS\_SSP\_PASSTHRU and CC\_CSMI\_SAS\_STP\_PASSTHRU – comment out quiece io – due to bug in firmware, the driver would timeout waiting for a reply message frame. It's recommended to not issue passthru's that write data to the media, as this could result in data corruption.
- mpt\_reply\_depth – This command line option default value is increased from 64 to 128. This prevents certain cases in which the device driver becomes depleted of message frames.

## **Major Changes For Version 03.02.52**

**Release Date: 06/22/2005**

## Driver General Changes

### Functionality

- Added support for displaying a string which translates the meaning of SAS loginfo dword returned from the firmware into something more meaningful to the enduser.
- Added bounds check in ISR that validates the cb\_idx value in the message context of the reply frame. The cb\_idx is an index to which driver issued the original request to firmware.
- Added bus reset after port enable. This only for SCSI. SCSI port page 2 , PortFlags is read to determine whether we can issue bus reset or not. This was added for cases when there is no BIOS, and its possible for initiator and target to not be at the negotiation parameters when the driver loads, which could result in command timeout at driver load time.

### Defect fixes

- CSMI – get controller config – was not returning the proper data for usSlotNumber. The driver returns the slot number from IOC Page 1. If the ioc\_page1->pci\_slot\_number = 0xFF, then return SLOT\_NUMBER\_UNKNOWN
- CSMI – get phy info – was not returning the proper device type for the attached device. This driver returns the Attached Device Info bits regarding device type from Phy Page 0.
- CSMI – get raid config – was not returning spare drive info. This driver returns the spare pool info from IOC page 5.
- SuSE driver update disks – were broken for SCSI, and FC parts older than FC949/FC939. This release will solve those issues where there are older SCSI/FC parts, and when there are combinations of SCSI/FC/SAS in same system. This release also will only load the drivers(mptspi/mptsas/mptfc) that are present at time of installation, e.g. the dud will auto detect the chips.

- SuSE binary rpms – added support for auto detecting the chips present at time of installing rpm, and only the respective split driver (mptspi/mptsas/mptfc) for those chips detected will be loaded.

## **Major Changes For Version 03.02.51**

**Release Date: 06/01/2005**

## **Driver General Changes**

### **Functionality**

- Added dumping Response Code for task management request on reply.
- For valid FC Response Info, added to the debug print string are the host, target, and lun ids. This give better understanding of where this info came from.

### **Defect fixes**

- Fix Loading driver with SAS and SCSI at the same time. The fix was mptsas.c was registering MPTSPI\_DRIVER when it called mpt\_register, when it should off have been MPTSAS\_DRIVER.

## **Major Changes For Version 03.02.50**

**Release Date: 05/25/2005**

### **Driver General Changes**

#### **Functionality**

- Introducing the split drivers format. There are three new drivers for each bus type; e.g. mptsas.ko, mptspi.ko, and mptfc.ko.
- Deliverables binary rpms will contain only kernels for SuSE service packs and RedHat updates. Use the source rpm if your wanting to build drivers for interim errata kernels. Support for SUSE Professional 9.1 and 9.2 has been removed.

#### **Defect fixes**

- Source RPMs – fix for compiling drivers for all kernels installed on the system. Before the source rpm was only compiling drivers for the booting kernel.
- Redhat DUD contains anaconda update for solving the issue of mptctl and mptlan not being copied from driver update disk to

hard disk. This will solution will be used instead of running post install script. When using DUD, you will need to pass:

“linux dd updates” at command line.

## **Major Changes For Version 03.02.19**

**Release Date:** 05/09/2005

## **Driver General Changes**

### **Functionality**

- RAID Hot Plug Events – When using online application which creates and deletes RAID Volumes, the driver will add and remove the scsi devices on the fly. In addition, the driver will respond to VOLUME STATUS changes, such as volume changing from Online to failed state, and vice versa. Also – the entire hot plug logic was streamlined into one worker thread, whereas before it was two separate threads handling adding and removing devices separately.
- CSMI STP/SSP passthru support for IR hidden phys disk. The driver will pass scsi command block to physical disks hidden in a volume. The driver will Quiese IO during passthru.
- Only allow SYNCHRONIZE CACHE to be issued to disk peripherals. Before it was working for any device that supported qtags.

- Inhibit dumping FCP Response Info whenever MPI\_SCSI\_STATE\_INFO\_VALID was set by adding an additional check in the reply message for ResponseInfo being valid.
- In Kconfig – clarifying the help message for FUSION\_MAX\_SGE.

#### **Defect fixes**

- pci\_disable\_io\_access – this function changed so only bit 0 was being set to 0, before it was setting the upper 8 bits of the word to zero. This function is used for fixing an errata in 1064/1068 for disabling port io access, called from FWDLB.

### **Major Changes For Version 03.02.18**

**Release Date: 04/21/2005**

#### **Driver General Changes**

##### **Functionality**

- Asynchronous Event Notification (AEN) has been implemented. This causes the driver to notify applications when certain events occur so they can immediately perform related activities.
- Support for system with multiple pci domains, ia64 platforms. mpt\_detect\_bound\_ports was modified so cards with same device:slot:func on different domains are recognized.
- Increased FUSION\_MAX\_SGE in Kconfig from 40 to 128.
- Support for MPI\_EVENT\_PERSISTENT\_TABLE\_FULL – when the driver receives this event, it will clear the persistent mappings for devices not present.

##### **Defect fixes**

- Some target devices can respond with Data Underrun on top of a Busy status. The MPT driver was returning SOFT\_ERROR for the Data Underrun condition, instead of reporting the BUSY status.

The driver has been changed to ignore the Data Underrun in this situation, and only report the BUSY status.

- When a target device responds with BUSY status, the MPT driver was sending DID\_OK to the SCSI mid layer, which caused the IO to be retried indefinitely between the mid layer and the driver. By changing the driver return status to DID\_BUS\_BUSY, the target BUSY status can now flow through the mid layer to an upper layer Failover driver, which will manage the I/O timeout.

## **Major Changes For Version 03.02.17**

**Release Date: 03/31/2005**

### **Driver General Changes**

#### **Functionality**

- LUN Persistency has been added. The Linux driver has the ability to perform a hard reset (kick start) of the chip, which causes the chip to loose the existing PUN mappings. After the chip has been restarted, it re-establishes communication with the devices on the link. If the device configuration has changed (devices added or removed) from when the system initially booted, the new mappings can be different, resulting in data corruption. LUN Persistency insures that mappings will not change across hard resets.
- MPI headers 1.5.9
- Host Page Buffer Persistent support.
- Added SRPMS – source RPMs, instead of binary RPMs.
- Prevent printing ioc info for lan and stm drivers within the interrupt handler.

### **Defect fixes**

- None.

## **Major Changes For Version 03.02.16**

**Release Date: 03/17/2005**

### **Driver General Changes**

#### **Functionality**

- Added command line option mpt\_pq\_filter.

#### **Defect fixes**

- Added Target Reset in mptscsih\_slave\_destroy – do this prior to flushing outstanding scsi commands and message frames. Before this fix, we were issuing target reset after scsi\_remove\_device, which could result in message frames being freed twice, and resulting in a panic from mptscsih\_io\_done.
- Added check in mptscsih\_io\_done, to check for 0xdeadbeef signature, which indicates that a message frame we are about to free was already previously freed.
- Removed calling mpt\_free\_msg\_frame in some places in mptctl.c, when it should not of been called, as it is already handled in the context of mptctl\_reply.
- Removed calling mpt\_free\_msg\_frame() from mptscsih\_abort.
- Properly return from mptscsih\_abort when there is an error returned from mptscsih\_TMHandler.
- Added more verbose reporting of scsi command during calling of error handling entry points.

## **Major Changes For Version 03.02.14**



**Release Date:** 03/04/2005

## **Driver General Changes**

### **Functionality**

- Upgraded to 1.5.8 MPI headers.
- Added lsiutil version 1.32., and use -I./ in the makefile so headers are referenced in above folder.
- Added new version update for MPTUTIL
- Added FC Transport Attributes backward compatibility to SLES9
- EBOS support
- Error handling – For data UNDERUN and scsi status returns SAM\_STAT\_BUSY, change is to return SAM\_STAT\_BUSY instead DID\_SOFT\_ERROR

### **Defect fixes**

- Fix hot plug issue: Fixed the bug of sas device status change events not being processed for one of two controllers. The driver was using global work task, it was fixed by putting the work task member in the per device extension.
- Fix hot plug issue: removing and adding drives, would result in “error 1” string displayed from mid layer. This was because driver was not calling scsi\_device\_put, which decrements device count; this occurred when the device was being removed from mid-layer.
- CSMI IOCLTS: Firmware download fix’s in the application and driver. Driver hang when compiled “-static”. Application would say download succeeded, when it didn’t. Added diag reset after fw download to insure updated fw revision displayed in another CSMI call.
- CSMI IOCTLS: Task management application fix’s for displaying completion data in proper format.
- CSMI IOCTLS: Set phy info, is not supported, thus application will announce that this call is not supported.

## **Major Changes For Version 03.02.13**

**Release Date:** 02/22/2005

### **Driver General Changes**

#### **Functionality**

- None

#### **Defect fixes**

- Pulling power to JBOD having more than one SATA drive would cause a PANIC or hang. There is a fix to correct this problem by maintaining a link list of SAS device change events, and to transverse this link list from the work task queue. This fix also includes code will which complete all SCSI commands that are outstanding for this when device when it is removed. The TARGET\_RESET has been added back in asyn event handling, which was removed in previous driver release.

## **Major Changes For Version 03.02.12**

**Release Date:** 02/10/2005

### **Driver General Changes**

#### **Functionality**

- Upgraded to 1.5.7 MPI headers.
- Added new version update for LSIUTIL v1.30
- Added new version update for MPTUTIL
- Added case for MPI\_FUNCTION\_TOOLBOX in IOCLT path for MPI Passthru's
- Added iocstate SySFS attribute.

- Host Buffer Support Fix's: added new function mpt\_host\_page\_alloc.

#### **Defect fixes**

- Removed target reset code during handling asynchronous event request for sas device removal.
- Fix in IOCTL path for SCSI\_IO passthru's: the sense width in the message flags was getting overwritten by a call to mpt\_msg\_flags() .

### **Major Changes For Version 03.02.11**

**Release Date: 01/28/2005**

#### **Driver General Changes**

##### **Functionality**

- Added target reset support for SCSI bus type.
- Upgraded to 1.5.6 MPI headers.
- MSI Support – created a command line option “mpt\_msi\_enable” for enabling MSI support. Default is MSI disabled.
- Removed the watchdog timer code in the ioctl path. The new method will wait for completion of request in the same thread.
- For Integrated Raid, added support for recreating the SAS device link list when volumes are added or deleted.
- Cleanup and renaming SAS support routines in mptbase.
- Added enhanced the event reporting code.
- Added CSMI ioctls framework for get\_location, get\_connector\_info, phy\_control.
- Added v.83 CSMI headers.

##### **Defect fixes**

- Minor fixes in CSMI – get raid configuration.

- Fix for when an Ultra320 device has a greater ID than a Ultra160 device, the Ultra320 device was negotiated with QAS enabled.

## **Major Changes For Version 03.02.10**

**Release Date:** 01/11/2005

### **Driver General Changes**

#### **Functionality**

- None.

#### **Defect fixes**

- Code was added to force the host sg\_tablesize parameter to be no more than the number of Scatter/Gather entries in the Chain Buffers plus the number of Scatter/Gather entries in a Message Frame. This ensures that IO's can be completed. Performance can be severely impacted if the number of Chain Buffers is small (this can be done by setting the mpt\_chain\_alloc\_percent to 1 or two), causing the IO's to be retried often. If mpt\_chain\_alloc\_percent is set to zero, sg\_tablesize is set to the amount of Scatter/Gather entries that will fit in a Message Frame; this reduces performance somewhat but does not cause IO's to be retried.
- Removed the watchdog timer code for task management request handling in mptscsih. This is a request from Kernel.org. The new method will wait for completion of task management request in the same thread.

## **Major Changes For Version 03.02.09**

**Release Date:** 12/15/2004

### **Driver General Changes**

## Functionality

- None.

## Defect fixes

- Message Frame allocation is `mpt_can_queue + 12` to allow for messages that are sent to the IOC but the IOC doesn't return the Message Frame back to the host driver. An example of this is the Event Notification request. This also reduces the amount of memory allocated per IOC.

## Major Changes For Version 03.02.08

Release Date: 12/06/2004

## Driver General Changes

### Functionality

- Moved the SAS CSMI IOCTLs to a separate source code called `csmisas.c`.
- PortEnable Timeout adjusted for Raid Volumes.
- Added new MPI Headers version 1.5.3.
- Replaced `ioc_chip` with `bus_type`.
- Hotswap fix so SAS drives added/removed immediately without having to use rescan script.
- Changing how command line options are passed, passing the `mptscsih` string has been removed. Use `modinfo` to see usage and description of the new parameters.
- Removed IOCTL `mptctl_hba_pciinfo` .

### Defect fixes

- Added code to allow only one downloadboot to onboard dual function MPT chips when the mpt driver is removed.

- Removed code to turn on Information Unit (IU) during Ultra 160 negotiations. The 1030 SCSI chip doesn't properly support IU at Ultra 160 speeds.
- Fixed code to properly do Big Endian/Little Endian conversions of req\_idx in the get and put Message Frames routines. This prevents panics on Big Endian machines.
- Removed mptscsih\_slave\_destroy vdev != NULL check fixed by removing the DEVICE\_NOT\_THERE calling of same function.

## **Major Changes For Version 03.02.06**

**Release Date: 10/25/2004**

## **Driver General Changes**

### **Functionality**

- Update to mpi headers v1.5.2
- PIO fix errata => disabling IO access
- mptctl\_hba\_pciinfo => usage of ioc link list, usage of \_\_user API
- mptctl\_fw\_downloadboot => usage of \_\_user API
- full use of lower endian api in GetSasInfo(mptbase.c), and CSML loctls(mptctl.c)
- use link list api for ioc->SasDevice
- add new PCI Device IDs for  
1064a,1064e,1066,1066e,1068,1068a,1068e,939x,949x
- always return residual id from mptscsih\_io\_done
- issue task management target reset when SAS drive is added within asyn event handler
- usage of semicolon (instead of comma or white space) for command line options
- Kernel.org updates: usage of \_\_iomem and msleep\_interruptible

### **Defect fixes**

- None.

## Major Changes For Version 03.02.05

Release Date: 10/08/2004

### Driver General Changes

#### Functionality

- Added ioctl downloadboot capability via application mptfdu.
- Added ioctl hba pciinfo.
- Added MSI Support.
- Added CSMI Raid Support ioctl's., Get Raid Config, Get Raid Info.
- Hot Swap – pulling drive, will automatically remove the per device memory allocation.
- Added new sysfs attribute queue\_depth.
- Added new sysfs attribute fc\_transport: port-id, port-name, node-name, however this code is ifdef via MPTSCSIH\_ENABLE\_FC\_TRANSPORT, and has to be recompiled to be enabled from the Makefile.
- More List API updates from Kernel.org.
- Clean ups in the slave\_configure and slave\_destroy, from Kernel.org.
- Removed FusionInitCalled code, from Kernel.org.
- Removed MPTSCSIH\_DBG\_TIMEOUT code.
- Added debug print statements.
- Removed dead code in driver: Multipath, and DumpDriver(MPTDMP\_DRIVER).
- Reset Host Diagnostic Buffer indicators during a Diagnostic Reset sequence.
- Application mptfdu updates.
- Application hptest/csmisas bug fix's.
- Added application mptutil.

#### Defect fixes

- None.

## **Major Changes For Version 03.02.04**

**Release Date:** 09/08/2004

### **Driver General Changes**

#### **Functionality**

- None.

#### **Defect fixes**

- For stp passthru, bug in checking stp drives, would fall past a failure condition check, even though it failed. Also, SATA drives are not enabling the STP\_TARGET bit in the device config page, therefore a check was added to insure we could issue STP passthru to SATA devices.
- Removed MPT\_DEBUG\_IRQ define from mptbase.c and Makefile, as its not longer used.
- MPI\_FUNCTION\_DIAG\_BUFFER\_POST processing was added in routine mptctl\_reply. In that processing, if the IOCStatus is MPI\_IOCSTATUS\_DIAGNOSTIC\_RELEASED, RELEASED is added to the buffer type's status, eliminating the need to manually release the buffer. In addition, if MsgLength is long enough to include TransferLength, that length is saved and returned in Query requests. Both of the above checks are also include if an asynchronous MPI\_FUNCTION\_DIAG\_BUFFER\_POST reply is received; this may occur if the proper ProductSpecific value is set in the request.
- Requests sent by mptlan do not include the NB bits.
- Routine mptctl\_reply was modified to process ioctl completions without any Reply buffer. Examples of this are SCSI IO's issued by ioctl routines which complete successfully (Turbo reply).



## **Major Changes For Version 03.02.03**

**Release Date:** 08/20/2004

### **Driver General Changes**

#### **Functionality**

- None.

#### **Defect fixes**

- Some routines were declared Static per a Kernel.org request.
- Host Diagnostic ioctl code was expanded to handle the UniqueId word, and to check for application compatibility.
- Host Diagnostic ioctl code now sets the Flags field in buffers being returned to applications.
- Fixed driver to correctly honor the command-line request dv:n. The driver will now only do the Basic portion of Domain Validation if this request is received.
- SCSI non-packetized devices (devices running at Ultra 160 or slower) are now limited to 64 luns. This prevents “phantom” luns being generated if a full lun scan is done.

## **Major Changes For Version 03.02.01**

**Release Date:** 08/09/2004

### **Driver General Changes**

#### **Functionality**

- SAS Support added, Diag Buffer Support Added.
- CC\_CSMI\_SAS\_GET\_PHY\_INFO – ioctl was not returning proper sas address for attached devices.

- CC\_CSMI\_SAS\_FIRMWARE\_DOWNLOAD – ioctl minor bug fix, was not successfully downloading image, due to flag not set in msg frame.
- CC\_CSMI\_SAS\_GET\_SCSI\_ADDRESS – ioctl minor bug fix, was failing to find sas address properly in device link list.
- CC\_CSMI\_SAS\_TASK\_MANAGEMENT – ioctl new implementation.
- Added support for Generic STP and SMP msg frame passthroughs.
- Added Host Page Buffer support for releasing memory to the fw, implemented thru doorbell handshake.
- ioctl application updates, and updated to v79 headers.

#### Defect fixes

### Major Changes For Version 03.01.14.23

Release Date: 08/05/2004

### Driver General Changes

#### Functionality

- 
- 

#### Defect fixes

- A fix for the module parameter “mptscsih”; which was not being exported.

### Major Changes For Version 03.01.13.23

Release Date: 07/27/2004

### Driver General Changes

#### **Functionality**

- 
- 

#### **Defect fixes**

- Fix panic for IM config when driver is loading. This was due to a NULL pointer in mptscsih\_initTarget.

### **Major Changes For Version 03.01.12.23**

**Release Date: 07/14/2004**

#### **Driver General Changes**

#### **Functionality**

- The port of the 2.05.22 thru 2.05.23 driver.
- Patch provided by Christoph Hellwig : remove the isense code.

#### **Defect fixes**

- None

### **Major Changes For Version 03.01.11.22**

**Release Date: 07/07/2004**

#### **Driver General Changes**

#### **Functionality**

- The port of 2.05.17 thru 2.05.22 driver

#### **Defect fixes**

- None

### **Major Changes For Version 03.01.10**

**Release Date: 07/02/2004**

## **Driver General Changes**

### **Functionality**

- Patch provided by Masao Fukuchi: mptctl updates for hot plug.
- Patch provided by Christoph Hellwig: mptlan updates for hot plug; remove CONFIG\_LBD ifdefs from fusion mptscsih

### **Defect fixes**

- None

## **Major Changes For Version 03.01.09**

**Release Date: 06/18/2004**

## **Driver General Changes**

### **Functionality**

- Patch provided by Masao Fukuchi: Remove limit on number of support hosts.
- Patch provided by Christoph Hellwig: kill scsi\_to\_pci\_dma\_dir usage, both pci and scsi use the same bits; kill mptscsih\_io\_direction and always trust the midlayer; kill usage of Scsi\_Foo typedefs; use <scsi/\*.h> headers; avoid list search in fusion ->proc\_info.
- Patch provided by Jeremy Higdon: Add readX\_relaxed .

### **Defect fixes**

- None

## **Major Changes For Version 03.01.08**

**Release Date: 05/26/2004**

### **Driver General Changes**

#### **Functionality**

- The port of 2.05.13 thru 2.05.16.01 driver

#### **Defect fixes**

- None

### **Major Changes For Version 03.01.07**

**Release Date: 05/24/2004**

### **Driver General Changes**

#### **Functionality**

- Patch provided by Christoph Hellwig: clean up backward compatibility with 2.4 kernel and older

#### **Defect fixes**

- None

### **Major Changes For Version 03.01.06**

**Release Date: 05/04/2004**

### **Driver General Changes**

#### **Functionality**

- Change in mptscsih\_io\_done. For MPI\_IOCSTATUS\_SCSI\_PROTOCOL\_ERROR return DID\_SOFT\_ERROR.

#### **Defect fixes**

- None

## **Major Changes For Version 03.01.05**

**Release Date:** 04/22/2004

### **Driver General Changes**

#### **Functionality**

- Added FC909 support back.

#### **Defect fixes**

- None

## **Major Changes For Version 03.01.04**

**Release Date:** 04/14/2004

### **Driver General Changes**

#### **Functionality**

- Additions to loginfo debug info.
- Added IOC debug error code info.
- Dump FCP ResponseInfo.
- Added element "segmentID" in get\_iocinfo IOCTL.
- 

#### **Defect fixes**

- Fix a Oops in mptscsih\_flush\_running\_cmds().

## **Major Changes For Version 03.01.03**

**Release Date:** 03/23/2004

### **Driver General Changes**

## **Functionality**

- Request from Jeff Garzik: Replace wrappers for CHIPREG\_XXX with defines.
- Remove support for FC909.
- Remove Portlo modules parameter.
- Move procmpt\_destroy function before pci\_unregister\_driver, as the memory allocated for the proc was not being deallocated.
- Remove mptscshi\_reset\_timeouts function. The timer was already expired when mod\_timer is called.
- Fix small bug in slave\_destroy, which could prevent domain validation on hidden drive in a RAID volume.

## **Defect fixes**

- Fix fifo memory allocation under 64bit systems.

## **Major Changes For Version 03.01.02**

**Release Date: 03/17/2004**

## **Driver General Changes**

### **Functionality**

- Request from Andi Kleen: put warning "Device (0:0:0) reported QUEUE\_FULL!" into debug messages.
- Request from Alexander Stohr: fix warnings from mptscsih\_setup and get\_setup\_token, when driver isn't compiled as module.
- Request from Randy Dunlap: Remove unnecessary min/max macros and change calls to use kernel.h macros instead.

### **Defect fixes**

- None

## Major Changes For Version 03.01.01

Release Date: 03/17/2004

### Driver General Changes

#### Functionality

- None.

#### Defect fixes

- IM fix in slave\_destroy, poor RAID1 performance.

## Major Changes For Version 03.01.00

Release Date: 03/05/2004

### Driver General Changes

#### Functionality

- The port of the 2.05.03 thru 2.05.13 driver.

#### Defect fixes

- None

## Major Changes For Version 03.00.04

Release Date: 02/24/2004

### Driver General Changes

#### Functionality

- Kconfig cleanup.
- Merged LAN driver updates from Kernel.org.

#### Defect fixes

- Fix bug with driver loading and no devices attached.



## **Major Changes For Version 03.00.03**

**Release Date:** 02/12/2004

### **Driver General Changes**

#### **Functionality**

- None.

#### **Defect fixes**

- Fix for discarded symbol in mptscsih.c, as seen in ia64. {  
mptscsih\_exit() }

## **Major Changes For Version 03.00.02**

**Release Date:** 02/02/2004

### **Driver General Changes**

#### **Functionality**

- Hot plug fix's requested from Christoph Hellwig.
- mptbase\_remove cleanups.
- mptbase\_shutdown – calls the sub drivers entry points.
- \_\_init, \_\_ exit cleanups

#### **Defect fixes**

- None

## **Major Changes For Version 03.00.01**

**Release Date:** 01/13/2004

### **Driver General Changes**

#### **Functionality**

- Hot plug updates.
- Define shutdown entry point to replace old reboot notifier call.

- mptbase\_pci\_table clean up.
- Change naming of MPTSCSIH\_DISABLE\_DOMAIN\_VALIDATION to MPTSCSIH\_ENABLE\_VALIDATION.
- CONFIG\_PM defined incorrectly.
- probe/release cleanup
- replace do\_div with sector\_div

#### **Defect fixes**

- None

### **Major Changes For Version 03.00.00**

**Release Date: 01/06/2004**

#### **Driver General Changes**

##### **Functionality**

- Added new PCI API support.
- Added ACPI support.
- Added CONFIG\_LBA, READ16, WRITE16 support.
- Reduce task management (abort=2sec,reset bus=5sec, timeout=10sec).

##### **Defect fixes**

- Underun fix.
- Chain buffer free list not being init properly.

### **Major Changes For Version 02.05.00.06**

**Release Date: 01/16/2004**

#### **Driver General Changes**

#### **Functionality**

- None.

#### **Defect fixes**

- IOMMU fix for SUSE.

### **Major Changes For Version 02.05.00.05**

**Release Date:** 11/12/2003

#### **Driver General Changes**

#### **Functionality**

- None.

#### **Defect fixes**

- Error handling fixes, e.g. use of host\_lock.

### **Major Changes For Version 02.05.00.04**

**Release Date:** 11/04/2003

#### **Driver General Changes**

#### **Functionality**

- Removed \_\_init from mptscsih\_setup.
- Removed \_\_init from get\_setup\_token.
- Changed copyright from 2002 to 2003.
- Added new mailto, and removed Pam.Delaney.

#### **Defect fixes**

- Added fix for 32bit emulation when unloading mptctl module.