

# MPT Fusion Linux OS Driver Release Notes

Driver Version: mptlinux-4.00.13.00-1

07/20/2007

## Compatibility:

- 53C1020, 53C1030, 53C1035 (Scsi Mode)
- FC909, FC919, FC929
- FC919X, FC929X, FC929XL, FC939X, FC949X, FC949ES
- SAS 1064, 1068
- SAS 1064E, 1068E, 1078E

## Special Notes For This Build:

- No special notes available at this time.

## Current Errata

- These drivers do not include disk dump support that is sometimes added by certain distro's. This appears to be replaced by kdump. Here is help for using kdump: <http://lse.sourceforge.net/kdump/>
- Kdump doesn't work for flashless controllers.
- Fusion.mptctl will not be provided on RHEL5 DUDs, nor KMP RPMS. This is the service script that autoloads the mptctl driver. You will find this only on SLES10 DUDs, and generic RPMS(found in rpm-1 folder).

## Driver Release Package Contents

### • *Source tarball*

Source tarball is named as: mptlinux-<version>-src.tar.gz

where:

<version> = version tag for this rpm

### • *RPM Binaries:*

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> = {rhel5, sles10}

<arch> = ia64 – Itanium Processor

x86\_64 – Opteron Processor, w/ x86\_64 install

i686 – i686 or later processor (Red Hat)

i586 – x86 installations (SuSE)

ppc – Power PC (64 bit)

• *Driver Update Disks*

dud images are named : mptlinux-<version>-<release>-<os>.<arch>.dd.gz

where:

<version>	=	version tag for this rpm
<release>	=	release tag for this rpm
<os>	=	{rhel5, sles10}
<arch>	=	ia64 – Itanium Processor x86_64 – Opteron Processor, w/ x86_64 install i686 – i686 or later processor (Red Hat) i586 – x86 installations (SuSE) ppc – Power PC (64 bit)

• *DKMS*

DKMS tarball is named : mptlinux-<version>-<release>.dkms.tar.gz

where:

<version>	=	version tag for this rpm
<release>	=	release tag for this rpm

This is an rpm that provide prebuilt binaries for major releases, and will compile drivers on the fly for the other kernels. Here is help on dkms:  
<http://linux.dell.com/dkms/dkms.html>

• *SRPMS*

SRPM images are named mptlinux-<version>-<release>.src.rpm

where:

<version>	=	version tag for this rpm
<release>	=	release tag for this rpm

SuSE:

i686

SLES 10  
Gold (2.6.16.21-0.8) (bigsmpt, debug, default, kdump, smpt, xen)  
SLES 10 SP1  
Gold (2.6.16.46-0.12) (bigsmpt, debug, default, kdump, smpt, xen)

x86\_64

SLES10  
Gold (2.6.16.21-0.8) (debug, default, kdump, smpt, xen)  
SLES10 SP1  
Gold (2.6.16.46-0.12) (debug, default, kdump, smpt, xen)

ia64

SLES10  
Gold (2.6.16.21-0.8) (debug, default)  
SLES10 SP1  
Gold (2.6.16.46-0.12) (debug, default)

ppc

SLES10  
Gold (2.6.16.21-0.8) (debug, default, iseries64, ppc64)  
SLES10 SP1  
Gold (2.6.16.46-0.12) (debug, default, iseries64, ppc64)

Red Hat:

i686

RHEL5  
Gold (2.6.18-8) (el5, el5PAE, el5xen)

x86\_64

RHEL5  
Gold (2.6.18-8) (el5, el5xen)

ia64

RHEL5  
Gold (2.6.18-8) (el5, el5xen)

ppc

RHEL5  
Gold (2.6.18-8) (el5, el5kdump)

## **Major Changes For Version 04.00.13.00-1**

**Release Date: 07/20/2007**

### **General Changes**

- Merged CSMI IOCTL code; all three driver streams using same common code.

## **Major Changes For Version 04.00.12.00-1**

**Release Date: 07/18/2007**

### **General Changes**

- ATTO 4LD support: rebranded 53C1030, required a different PCI vendor id, and spi\_port\_page\_2 is in a different format than specified in the mpi spec, so we add code to reformat the bits into our format.
- Merged in the sysfs patch changes requested by the linux community: driver\_version removed, removed usage of buf\_out, and hba\_properites obtains driver\_version from /sys/module/mptbase/version.
- Removed setting the NB bits for task management request that is sent via high-priority-request-q.
- cb\_idx changes: mpt\_get\_cb\_idx function changed to scans the ids in descending order, and MPT\_MAX\_PROTOCOL\_DRIVERS changed back to 0xF.
- Brocade support for loading mptctl at boot time in the RPMs. This involved updating the init script fusion.mptctl.

## **Major Changes For Version 04.00.11.00-1**

**Release Date: 06/26/2007**

## General Changes

- SLES10 Duds were not working. The problem was the directory path to the drivers on the duds was incorrect.
- The CSMI IOCTL routine `csmisas_get_raid_config` has been changed to report the correct drive count when either `DRIVES` or `DEVICE_ID` is requested.
- The CSMI IOCTL routine `csmisas_get_raid_config` will return a place holder for missing drives (actually implemented in the 4.00.08.00 version)
- “LSI Logic Corporation” copyright changed to “LSI Corporation” through out the sources. And all other references to Logic have been removed.
- [Mpt\\_linux\\_developer@lsi.com](mailto:Mpt_linux_developer@lsi.com) mailto changed to [DL\\_MPTFusionLinux@lsi.com](mailto:DL_MPTFusionLinux@lsi.com)
- `SendEventNotification` changed to send request via doorbell using handshaking protocol. Interrupts are enabled after this call completes.
- The watchdog FAULT handler was changed to run in user context.
- The `MPT_IOC_POST_RESET` callbacks after soft and hard reset are invoked even though the controller didn’t recover. If the controller didn’t recover, the `ioc->active` flag is set to zero. When `ioc->active` is zero, the callback handlers will prevent sending commands that require interrupts.
- The callback index called `cb_idx` found through out the code was changed from integer to `u8`. `mpt_stm_index` and `mpt_lan_index` were deleted, and `cb_idx` is obtained thru new function `mpt_get_cb_idx`. All the associated callback index’s and functions that return those values are all changed to `u8`.
- Cleanup `mptctl` prints and debug messages so they are using the `MYIOC_s_XXX_FMT` format.
- Fix bug for `MPT_COMMAND` ioctls that sends `mpi_functions` equal to “task management” request. For SAS the callback index was not set properly, thus having its completion routine routed to the

wrong function. From mpt\_put\_msg\_frame\_hi\_pri, the input parameter was changed from ioc->TaskCtx was to mptctl\_id.

- Big Endian fixes in mptsas\_send\_discovery\_event and mptsas\_send\_raid\_event. Under power pc, when a volume was activated via lsiutil (for an inactive volume), the device driver was not reporting the volume to upper layers, hence the volume wasn't seen.
- mpt\_fc\_log\_info - rewrite, so it includes lsi/mpi\_log\_fc.h
- Cleanup error handling entry points print and debug info.
- Delete lsi/mpi\_inb.h - unused.
- mpt\_diag\_reset - code has been added to break early from the "wait-for-ready" loop after diag\_reset. The early break occurs when when the card is found to be in FAULT state after one iteration.
- Mpt\_do\_ioc\_recovery - force reset of alternate controller when the reason is MPT\_HOSTEVENT\_IOC\_RECOVER.

## **Major Changes For Version 04.00.10.00-1**

**Release Date:** 06/13/2007

### **General Changes**

- Driver was stripping the first three characters of product name. For instance, "BRE040" is being displayed as "040". The fix implemented in MptDisplayLocCapabilities, is to delete the code which strips of the first three characters of "ioc->prod\_name".

## **Major Changes For Version 04.00.09.00-1**

**Release Date:** 06/11/2007

### **General Changes**

- Added support in mptfc.c for pci vendor id (0x1657) - FC949E, and displaying the string "BRE040" when the driver loads

- Add support for displaying revision strings for 1064E B3, 1068E B3, 1078 C2, and 1030T A3 when the driver loads.
- Removed the “ioc->active” check in mptctl\_ioctl.

## **Major Changes For Version 04.00.08.00-1**

**Release Date: 06/1/2007**

### **General Changes**

- MPI v1.5.16 Headers
- SLES10 SP1 support
- Watchdog timer for monitoring controller ioc state for FAULTs
- Several Task management Updates, issue Message Unit Reset as first level recovery from timeouts, task\_abort always returns SUCCESS when it determines the outstanding command was completed.
- 1030 errata fix – on a slower PCI bus (75 MHz or less) on a non-paced (below U320 speed) 1030 data transfer the DMA engine can be prematurely shut off, resulting in a data underrun condition (even though the target device transferred all of the data). This happens on a Read or Verify only (not on a Write).
- Increase SAS task management timeouts to 30 seconds
- Increase mpt\_config timeout to 15 seconds
- Fix panic when creating IME volumes using cfggen
- Add command line option “mpt\_disable\_hotplug\_remove: to disable hotplug remove in mptsas. Also sysfs attribute to toggle this flag while driver is running.
- Add hi-priority request queue support for SAS task management requests.
- Firmware download boot updates

## **Major Changes For Version 04.00.07.00-1**

**Release Date: 05/10/2007**



## **General Changes**

- Fix driver compilation errors with SLES10 SP1. This was fixed by enabling the MPT\_WIDE\_PORT\_API defines at the top of mptsas.c
- CSMI\_GET\_CNTRL\_CONFIG – set the uHighPart variable when BaseMemoryAddress is found to be above the 32bit limit.
- The functions mptscsih\_do\_cmd and mpt\_config, which send internal commands, were cleaned up. The handling of internal command timeouts using watchdog timers were deleted, replaced with the wait\_for\_completion\_timeout API and entry/exit mutex's.
- The flag hd->resetPending was renamed to hd->quiesce\_io. This flag used to quiesce io during host reset. The use of this flag was expanded to quiesce io for any task management request as well as SAS discovery. For hard reset, IO will be quiesced for the alternate controller when the controller is for dual pci function, such as the 1030. Use the spin lock diagLock, instead of FreeQlock when setting or clearing the quiesce\_io flag.
- From mptbase.h, deleted several unused structure variables in MPT\_ADAPTER, CONFIGPARAMS, and MPT\_SCSI\_HOST. Deleted MPT\_LOCAL\_REPLY structures, and moved sas\_mapping and sas\_device\_info structures over to mptsas.h.
- SAS hotplug enhancements – for hot add case, re-queue the event on 5 second intervals for 1 minute until the device is found in the topology. Added unique exit codes for mptsas\_add\_end\_device to help with debugging hot add events.
- Add support to report a deleted RAID volume to upper layers when a firmware event is received saying the volume has been disabled.
- Added support in mptfc for displaying port link speed.
- Fix setting SMART event data in mptscsih\_copy\_sense\_data, so the addition of channel, target, and lun are using "|" instead of "||".

## **Major Changes For Version 04.00.06.00-3**

**Release Date: 04/26/2007**

## General Changes

- Adding KMP support, and new subfolder kmp-`${release_version}`

## Major Changes For Version 04.00.06.00-2

Release Date: 04/25/2007

## General Changes

- RHEL5, adding support for installing RPM after a DUD install.

## Major Changes For Version 04.00.06.00-1

Release Date: 04/10/2007

## General Changes

- Documentation headers were added through out mptsas.c
- The function mpt\_HardResetHandler input parameter is changed from NO\_SLEEP to CAN\_SLEEP, called from mpt\_timer\_expired, mptscsih\_taskmgmt\_complete, and mptscsih\_timer\_expired.
- Added MPI\_EVENT\_SAS\_DEV\_STAT\_RC\_ASYNC\_NOTIFICATION from mpt\_display\_event\_info.
- In mptctl.c, changed the severity of the printk following mpt\_verify\_adapter, from KERN\_ERR to KERN\_DEBUG.
- Hotplug handling improvements which decrease the impact of keyboard freeze when many drives are added and removed. The calling of mptsas\_discovery\_work from mptsas\_hotplug\_work was removed, and devices can be added from the discovery thread. The handling of raid events for hidden raid components was broken out into MPTSAS\_XXX\_PHYSDISK and MPTSAS\_XXX\_PHYSDISK\_REPROBE events. Some improvements in mptsas\_send\_raid\_event reduce the number times raid events are scheduled. The ssleep() in mptsas\_test\_unit\_ready was moved so its only called when the device is known to be busy, also support for sending test\_unit\_ready to hidden raid component was added. Fix bug in mptsas\_probe\_expander\_phys where the "struct device" parent pointer was set to NULL, resulting in device not being reported to

transport layer after hot delete/add events. Hot delete/add functions were broken out into new functions mptsas\_add\_end\_device and mptsas\_del\_end\_device.

## **Major Changes For Version 04.00.05.00-1**

**Release Date: 03/26/2007**

### **General Changes**

- mptfc\_SetFcPortPage1\_defaults into mptfc\_rescan\_devices which executes in a work queue thread to allow board hard reset processing to complete. mptfc\_SetFcPortPage1\_defaults was being called by POST\_RESET processing with diagPending set. Hangs were observed due to mpt\_config() not completing due to the config message timing out. The hard reset handler couldn't execute due to diagPending being set. This change allows another hard reset which will clean up the outstanding config message.
- Fix oops in mptsas\_ioc\_reset. This would occur if a timeout occurs at driver load time, prior to scsi host registration. For example, at driver load time, config pages are read to obtain defaults, and a timeout could occur if the request didn't complete. Added are sanity checks in mptsas\_ioc\_reset checking for NULL pointers.
- Added verbose messages to track when devices and expanders are hot added or deleted.
- Added support to handle hidden raid component removal when the MPI\_PD\_STATE\_FAILED is received.
- Changes surrounding hidden raid components, such as preventing task management request and sync cache when the device is known to be a hidden raid component
- Add support to prevent sync cache for deleted devices when they

- known to be physically removed; fix in mptsas and mptfc.

## **Defect fixes**

- **Issue:** Source RPMs failed while building the binaries.
- **Reported by:** test
- **To Reproduce:** install the SRPM, then go to /usr/src/package, and try `rpmbuild -bb mptlinux.spec`
- **Description of Change:** Added fusion.mptctl in Sources section of spec file.
  
- **Issue:** Pulling a drive from a RAID1 volume will result in volume being remounted as “read-only”.
- **Reported by:** Customer
- **To Reproduce:** Install SLES10 onto RAID1 volume with a driver supplied from LSI (not the built-in SLES10 driver), then send some IO to the volume, pull one of the drives, then monitor errors sent to /var/log/messages
- **Description of Change:** The reason the volume was being re-mounted as ‘read-only’ was when the drive was pulled, IO to volume was accidentally being terminated with DID\_NO\_CONNECT, which means there is no device. The end result is the filesystem thinking the device was removed, thus takes less risk by remounting it with write access disabled. This problem manifested due to hidden raid components being exposed. The per device object retains the target id as the physdisk id in the object and it so happens that the physdisk id is matching the volume id. The fix was to add sanity check insuring that when the hidden raid component is torn down, it will only terminate IO to that device, and not the volume

## **Major Changes For Version 04.00.04.00-1**

**Release Date: 03/06/2007**

## General Changes

- MPI header update version 1.5.15
- New “on the fly” enabling of debug logging. This can be modified in SysFS, located in `/sys/class/scsi_host/host#/debug_level`. In addition, there is a new command line option in `mptbase.c` that will enable debug logging at driver load time. The command line option is called `mpt_debug_level`. Example:

```
insmod mptbase.ko mpt_debug_level 0x408
```

This enables SCSI reply info and events logging.

- Change a majority of the debug logging to KERN\_DEBUG priority.
- Display board rev level and chip type when driver loads in kernel log.
- Several new SysFS host attributes added in `/sys/class/scsi_host/host#`. There is new script in source that will dump these new attributes. It's found in subfolder `scripts`, the file called `hba_properties`. These new attributes will display various versions of bios/driver/firmware/mpi/nvdata, as well as the board assembly/name/tracer, in addition to `io_delay` and `device_delay`.
- CSMI IOCTL `get_controller_config` – return `base_io` and `base_memory` address from the values setup when driver loads. It was found with 1078 that IO address range was not being returned. This was due to the expected IO range not being found in the first resource bar, which is what the code was expecting.
- CSMI IOCTL `get_controller_config` – removed function `csmisas_get_manufacture_pg0`, then instead obtaining the board serial number saved off when driver initialized.
- Added support for upto 256 SGEL's for `mptfc`.
- Added support for displaying `SAS_EXPANDER_STATUS_CHANGE` event in the kernel logging.
- `Mptlan` – fix for setting `RequestNB` to zero.

- Fix memory leak in mptsas and mptspi, which would occur at driver load time if pci\_register\_driver failed.
- Increased mpt\_cmd\_retry\_count from 60 to 144 seconds.
- In mptscsih\_io\_done, removed the SAM\_STAT\_BUSY if/then check that would return DID\_BUS\_BUSY, instead return the sam status as is. The scsi mid layer no longer does infinite retries when busy is returned.
- Cleanup scsiio reply logging; renaming the function from mpiscsih\_iocstatus\_info\_scsiio to mptscsih\_info\_scsiio.
- Picked up some upstream janitorial driver cleanup, most changes in documentation.

### **Major Changes For Version 04.00.03.00-3**

**Release Date:** 03/06/2007

#### **General Changes**

- Re-spin dkms rpm with a modification in spec file of adding xen support.

### **Major Changes For Version 04.00.03.00-2**

**Release Date:** 03/1/2007

#### **General Changes**

- Removed application source code from package.
- RHEL5 support

### **Major Changes For Version 04.00.03.00-1**

**Release Date:** 02/28/2007

## General Changes

- Changed memory allocation method in csmi ioctl stp passthru to use the get\_free\_page API, due to some request failing.

## Defect fixes

- **Issue:** Panic when csmi ioctl GET\_PHY\_INFO is called.
- **Reported by:** Customer
- **To Reproduce:** This is seen on RHEL5 32bit, using csmitool, option #7.
- **Description of Change:** Root problem was stack overflow. Change code to allocate memory for input/output buffer from kernel slab rather than the stack. The requested buffer was 2kb, which is too large for the stack.

## Major Changes For Version 04.00.02.00-1

Release Date: 02/16/2007

## General Changes

- Sorting volumes in ascending order before they are reported to upper scsi layers.

## Major Changes For Version 04.00.01.00-1

Release Date: 01/08/2007

## General Changes

- Merge in upstream kernel changes from 2.06.20 kernel; including kernel-doc changes, and INIT\_WORK(work task) API change.

- Memory allocation in csmisas.c was changed from kmalloc to get\_free\_pages where more than 128 KB of memory may be requested. This allows the IOCTL to proceed normally rather than failing due to a memory allocation failure. This was noticed in the ssp\_passthru routine that was being used by an application to flash disk drive FW that was about 750 KB.
- Sorting volumes so they are reported in ascending order. The driver is reporting volumes based in ioc page 2, and firmware can fill in this config page with volumes listed in descending order.

### Defect fixes

- **Issue:** Panic when ioctl passed thru mptctl.ko times out.
  - **Reported by:** Test.
  - **To Reproduce:** This was replicated in creating an IME volume.
  - **Description of Change:** Change mpt\_HardResetHandler in passing CAN\_SLEEP, instead of NO\_SLEEP.
- 
- **Issue:** Target reset occurs during creation of an IME volume.
  - **Reported by:** Test.
  - **To Reproduce:** This was replicated in creating an IME volume.
  - **Description of Change:** The MPI\_EVENT\_RAID\_RC\_VOLUME\_CREATED firmware event was issued by firmware too soon, and the target would timeout the first inquiry command, which lead to target reset. The fix was to add a delay via mptsas\_test\_unit\_ready, which by the time the inquiry was passed, it was accepting commands.

### Major Changes For Version 04.00.00.00-1

Release Date: 01/08/2007

### General Changes



- Bump Version

## Major Changes For Version 03.03.20.00-1

Release Date: 01/08/2007

### General Changes

#### Functionality

- SAS Loginfo updates
- Isiutil updates - version 1.48.11
- endian bug fix's for ppc
- renamed mpt\_sp\_ioc\_info to mpt\_iocstatus\_info, and added some updated printks
- CSMI = GET\_RAID\_CONFIG (Device ID and Additional Data) were not working, and it involved bug fix's in both driver and application.
- CSMI = GET\_LOCATION - two hot spares was not being displayed, only one
- MPT\_DEBUG\_REPLY - cosmetic clean up for this debug level

#### Defect fixes

- **Issue:** Upgrading from an older to newer RPM doesn't upgrade properly when using -Uvh options. You will see several 'mv' errors.
- **Reported by:** Test.
- **To Reproduce:** Install an rpm using 'rpm -ivh', then try upgrading to a newer version using 'rpm -Uvh'.
- **Description of Change:** Corrected several bugs in the rpm spec file.
- **Issue:** Hidden raid component exposed to block layer after resysnc
- **Reported by:** Development.

- **To Reproduce:** Create an IM volume, and resync one of the drives. After the drive completed, see drive assigned block dev node, such as /dev/sda.
  - **Description of Change:** Added flag ev->hidden\_raid\_component to track whether a drive needs exposing during hot plug handling.
- 
- **Issue:** panic in mptspi\_is\_raid
  - **Reported by:** Development.
  - **To Reproduce:** Load mptspi (53c1030) driver when there is IT firmware.
  - **Description of Change:** Added sanity NULL pointer check for ioc\_page\_2. In previous version of driver, the volume pages are not cached when IR firmware is not detected.

## **Major Changes For Version 03.03.19.00-1**

**Release Date:** 12/20/2006

## **General Changes**

### **Functionality**

- CSMI IOCTL – set\_phy\_info , changed return code from CSMI\_SAS\_STATUS\_FAILED to CSMI\_SAS\_STATUS\_BAD\_CNTL\_CODE to comply to the csmi spec for returning proper code when ioctls are not implemented.
- CSMI IOCTL – get\_raid\_element and set\_raid\_operation, added framework for these ioctls, but they are not implemented

- CSMI IOCTL – csmisas\_raid\_id\_to\_num – changed return value to signed because failure case is a negative number, and with it being unsigned, it could be interpreted incorrectly.
- CSMI IOCTL – csmisas\_get\_number\_hotspares – changed to return zero for failure case. Before it was returning negative number when mpt\_config failed.
- CSMI IOCTL – csmisas\_get\_ioc\_pg5 – added data size as input parameter for the return buffer. In the testing of two global hotspares, it was found the data size was not calculated properly, which resulted in the 2<sup>nd</sup> hotspare info was not returned.
- CSMI IOCTL – csmisas\_get\_raid\_config and mptspi\_is\_raid – added check to validating if ioc page2 was non-zero. In previous release, a change prevents reading associated RAID pages when its determined that the firmware is IT.
- mpt\_send\_handshake\_request – was reverted back to previous implementation so the data size was passed as input param.
- MPTSAS\_MAX\_LUN = changed the max\_lun from 511 to 16895. According to SAM3 section 4.9, for luns greater than 255, you must use the flat space address model, which means bit 6 of the 1<sup>st</sup> byte needs to be set. 16895 is the equivalent to 511.
- Fix'ed the reporting of the proper sas\_address for the hba phys that form a wide port. This is reported in the SySFS under /sys/class/sas\_phy/phy-x:y/sas\_address
- Added sanity checks in mptsas\_ioc\_reset to prevent possible opps when the list hd->target\_reset\_list is checked. This could occur if host reset occurs before this list is initialized. Also moved the spin locks down in mptsas\_probe to after the list is initialized.
- mptscsih\_io\_done – If MPI\_IOCSTATUS\_SUCCESS and MPI\_SCSI\_STATUS\_BUSY is returned, avoid returning DID\_BUSY\_BUSY for SPI. This requested by vmware.
- mptscsih\_io\_done – If MPI\_IOCSTATUS\_SCSI\_IOC\_TERMINATED returned for FC, avoid infinite retries by returning DID\_ERROR instead of DID\_RESET.
- mptscsih\_IssueTaskMgmt – If handshake fail's or request times out, clear the tmPending and tmState flags. Since these flags were not

cleared, the next task management request would not get issued since sanity checks of these flags would fail. These flags were not being clear because FAILED was being returned, and from the eh entry points, we were only clearing them if the return was not the "FAILED" return value.

- mptscsih\_taskmgmt\_complete – for task aborts, check the termination\_count in the reply mf to verify whether the task was completed. Without this fix, its possible that the driver could return a FAILED status to scsi-mid layer, when actually the command was aborted. This could occur during port down retry, as the firmware returned MPI\_IOCSTATUS\_SCSI\_TASK\_MGMT\_FAILED even though it completed the task. The firmware would do that because the tasks are in the internal pending Q, instead of the request Q, so the task abort never issued across the wire.
- mptscsih\_get\_scsi\_lookup and mptscsih\_set\_scsi\_lookup – change the spin locks to having irqsave/irqrestore API. During some target mode testing, was seeing periodic opps when this API is called.

## **Major Changes For Version 03.03.18**

**Release Date: 11/27/2006**

## **General Changes**

### **Functionality**

- Merged CSMI IOCTLS that can be shared between 2.6, 3.2, and 3.3 path drivers
- Merged RHEL5 and SLES10 functionality
- Change ioc->DevicesPerBus max value based on port\_facts->PortSCSIID, instead of ioc->MaxDevices. This is to insure proper device scan at driver load time. The MaxDevice fields

means max number of targets the firmware will enumerate, but with persistent ids, it does not reflect the maximum number of target\_ids that firmware could assign. The firmware reserves some target\_ids for persistent\_ids, but it will not exceed PortSCSIID, thus this required change.

## **Major Changes For Version 03.03.17.05**

**Release Date:** 11/17/2006

### **General Changes**

### **Defect fixes**

- **Issue:** system hang at bootup after installing csmi agents.
- **Reported by:** Test.
- **To Reproduce:** Install csmi agents and reboot.
- **Description of Change:** Fixed a panic in csmisas\_fill\_location\_data RAID() due to NULL pointer.

## **Major Changes For Version 03.03.17.04**

**Release Date:** 10/25/2006

### **General Changes**

## Defect fixes

- **Issue:** cmsitest tool GET\_LOCATION ioctl doesn't work  
**Reported by:** Customer.  
**To Reproduce:** Use the cmsitest tool to issue GET\_LOCATION ioctl  
**Description of Change:** Add helper routines that will convert OS to FW mapping. This ioctl input is OS mapping. This fix was also applied to GET\_DEVICE\_ADDR, GET\_SCSI\_ADDR, and ISSUE\_TM\_PASSTHRU, which also have mapping pass as the input.

## Major Changes For Version 03.03.17.03

Release Date: 10/20/2006

## General Changes

## Defect fixes

- **Issue:** task aborts resulting from cable pull during heavy I/O  
**Reported by:** Customer.  
**To Reproduce:** Setup several targets with IO sent simultaneously to each device, then cable pull. Both IO Missing delay and device missing delay need to be enabled.  
**Description of Change:** The worker threads were not invoked fast enough following device\_not\_responding event, thus scsi mid layer was timing I/O out. The change is to issue target reset immediately when the event arrives from the interrupt handler. A link list is used to queue up the commands.
- **Issue:** cmsitest\_tool : sas\_address for failed drives is not retained in various configurations, most notably RAID0.  
**Reported by:** Customer.  
**To Reproduce:** Create a RAID0 volume, and pull a drive. The sas\_address should be non-zero for the pulled drive.

**Description of Change:** Added device link list to retain sas\_address's when devices are added. Devices are not removed from the list after they have been deleted, however when a device is added, there are sanity checks to insure there are unique target id and/or sas address populated in the list.

## **Major Changes For Version 03.03.17.01**

**Release Date:** 10/13/2006

## **General Changes**

### **Functionality**

- All Debugging printk's in csmisas.c module are moved under MPT\_DEBUG\_CSMISAS. Also added more enhanced debugging for ssp\_passthru.

### **Defect fixes**

- **Issue:** csmitool - GET\_RAID\_CONFIG doesn't show fault tolerant volume with rebuilding status when it's rebuilding.

**Reported by:** Customer.

**To Reproduce:** Create a IM volume, and pull a drive, and reinsert. Use csmitool to display raid\_config, and notice the RaidStatus.

**Description of Change:** The driver wasn't looking at the correct member in the volume\_page0 structure to determine if the array was rebuilding, or if the array was inactive.

- Issue:** csmitool – GET\_RAID\_CONFIG doesn't show FAILED logical volumes.

**Reported by:** Customer.

**To Reproduce:** Create a IS volume, and pull a drive. The volume becomes FAILED. Use csmitool to display raid\_config.

**Description of Change:** Add support in driver for FAILED logical volumes.
- Issue:** csmitool – SSP\_PASSTHRU was sending passthru to incorrect target after a logical volume is created.

**Reported by:** Development.

**To Reproduce:** Create a volume, and send INQUIRY via SSP\_PASSTHRU. Notice that one of the sas\_address's will return data to the logical volume instead of the hidden physical disk.

**Description of Change:** The change is to look at the phy\_info->attached.phys\_disk\_num to determine if the device is a hidden raid component, and for RAID\_PASSTHRU, send the correct target phys disk number for the target\_id.

## Major Changes For Version 03.03.17

Release Date: 10/09/2006

## General Changes

### Functionality

- LSIUTIL update – version 1.47
- Add command line option max\_lun for mptsas and mptfc. The default is 511. The scsi\_mid layer parameter is max\_report\_luns, for changing the max supported luns. Both parameters will need to modify if greater than 512 is required.
- CSMI GET\_LOCATION – add hot spare support when the target id is for a logical volume.



- CSMI SSP\_PASSTHRU – move code to read in payload buffer for a WRITE to the top of function, where the entire buffer could be properly read in from user to kernel space.
- CSMI GET\_RAID\_CONFIG – fix volume size for greater than 2TB, but in raid component calculation and hot spare sanity checks
- CSMI GET\_RAID\_CONFIG – add support for displaying offline logical volumes, as well as adding support in in csmitest tool. Including a bug fix in csmitool which had caused an infinite loop when an ioctl returned unsuccessful return codes.
- CSMI – some little endian fix's (some 32bit fields were using 16bit le conversion).
- ioctl status flags cleanup, in both mptctl and csmi.
- Fix driver panic when unloading mptfc. This was created with previous driver when support for inactive raid volumes was added. The problem was due to the inactive\_list link list not being initialized for FC.
- In handshaking routines, changing mdelay to udelay, as it fail's when handshaking during interrupt time.
- Mptfc updates, support for new fibre channel attributes, merged in from upstream kernels.
- Mptfc updates, support for blocking error handling when devices are being removed, thus preventing panic situation. This code merged in from upstream kernels.
- Adding spin\_locks when accessing ScsiLookup[] array, protecting this array as its touched during request, completion, and error handling time.
- Mptspi – domain validation fix's to insure the inquiry max speed test is negotiating at correct speed. This fix involves reading the inquiry data, and setup the proper min sync. This fix was corrected in 2.6.19 kernels in spi transport layer. Also added debug messages to properly debug, enabling MPT\_DEBUG\_DV.
- Mptspi – fix infinite domain validation when a command times out, resulting in host reset. The fix is to program last known parameters w/o having start domain validation all over again.

- Mptsapi – sanity checks added to prevent panic which could occur if the reading of config pages within mpt\_attach timeout when driver loads, thus resulting in a host reset. The host reset callback handler in mptsapi was assuming hd pointer was non-zero.
- Adding channel support in mptscsih\_search\_running\_cmnds , supporting greater than 255 targets. This would effect a host reset, when there were devices populated on more than one bus.
- Task aborts were returning FAILED to scsi mid-layer, even though the task management request succeeded. Thus was fixed in the hd->tm\_iocstatus check in mptscsih\_IssueTaskMgmt function, adding TASK\_TERMINATED and IOC\_TERMINATED.

## **Major Changes For Version 03.03.16**

**Release Date: 09/07/2006**

## **General Changes**

### **Functionality**

- Greater than 256 target and lun support, upto 32bit value, restricted by firmware max supported devices.
- Inactive RAID volume support; reporting its hidden raid components at driver load time, and when foreign configurations are added. When inactive volume is deleted, the hidden raid components id's are reported to block layer. When

inactive volume is activated, then the volume id is reported to block layer.

- Csmisas.c – get\_raidconfig – adding support to report DriveType for hotspares.
- Mptspi.c – Cleanup of mptspi target\_alloc and slave\_alloc routines; adding mptspi\_qcmd.
- Mptfc.c – when initiator protocol is disabled, return 0, instead ENODEV. Returning EDNODEV, prevented additional controllers to be probed.
- Mptbase.h – Delete hd->Targets[] memory array. Changes in VirtTarget, using id instead of target\_id, and channel instead of bus\_id, and delete luns[8].
- Mptbase.c – Cleanup mpt\_findImVolumes; changed malloc calls to use GFP\_KERNEL, instead of GFP\_ATOMIC, added proper allocation, deallocation of plocPg2

## Major Changes For Version 03.03.15

Release Date: 09/01/2006

## General Changes

### Defect fixes

- **Issue:** csmitool – ioctl get\_raid\_config, doesn't display a sas address when drive is pulled.

**Reported by:** Customer.

**To Reproduce:** Create a IM volume, and pull a drive. Use csmitool to display raid\_config, and notice the sas\_address.

**Description of Change:** Add a link list inside the volume vtarget instance that maintains the sas address, target id, and channel for all the hidden raid components. When a drive is pulled, the old data is retained. When a new target is added to existing volume, the new raid component info is added into the link list. If there is an target id/channel that match's the new device, the old data is replaced with the new data.

## **Major Changes For Version 03.03.14**

**Release Date:** 08/25/2006

## **General Changes**

### **Functionality**

- Add support to display driver version when using the modinfo utility.
- vdev sanity check in mptfc\_qcmd.
- Added lsiutil version 1.46.06
- Added updated csmitest\_oem v90 support

### **Defect fixes**

- **Issue:** csmitool displays hotspare in IS volumes.

**Reported by:** Customer.

**To Reproduce:** Create two volumes that are IM and IS, and a hotspare. Then using csmitool to display select GET\_RAID\_CONFIG, verify that hotspare is only listed for the IM volume.

**Description of Change:** Added check for volume type.

## Major Changes For Version 03.03.13-2

Release Date: 08/16/2006

### General Changes

#### Functionality

- Removed xenpae configuration from the i686 build.
- Added Power PC `ppc64` driver update disks and rpms.

#### Defect fixes

- **Issue:** Unresolved symbols using driver update disks.  
**Reported by:** Software test.  
**To Reproduce:** Installing SLES10, with DUD, selecting F5 option. Cntrl^Alt^F3 will display unresolved symbols when the driver are loaded from DUD.  
**Description of Change:** The Yast installer was unloading media drivers in incorrect order when attempting to load the DUD drivers. The unresolved symbols came because the media drivers were never unloaded. The fix was adding a file on the dud called module.order, so the installer knows what order drivers need to be unloaded and loaded.

## Major Changes For Version 03.03.13

Release Date: 08/08/2006

### General Changes

## Functionality

- Added debug printks for new events  
MPI\_EVENT\_SAS\_BROADCAST\_PRIMITIVE  
MPI\_EVENT\_SAS\_INIT\_DEVICE\_STATUS\_CHANGE  
MPI\_EVENT\_SAS\_INIT\_TABLE\_OVERFLOW  
MPI\_EVENT\_SAS\_SMP\_ERROR
- removed obsolete flag ioc->reload\_fw

## Defect fixes

- **Issue:** Path is not being added in a Controller Offline/Online, No REPORT\_LUNS command was sent in the Ctlr Plug-back  
**Reported by:** Customer.  
**To Reproduce:** By adding/removing/adding cables, offline/online target mode controllers using serial console commands  
`rdacMgrAltCtlResetHold` and `rdacMgrAltCtlResetRelease`  
**Description of Change:** Fix's surrounding issuing TUR during device add. The driver needed to send the TUR's on one sec intervals, and only retry on sam\_status\_busy, unit\_attention, and device becoming ready.
- **Issue:** The LSI HBA driver gives a Panic after a Cable Pull  
**Reported by:** Customer.  
**To Reproduce:**
  1. It's a 1x1 setup with one host connected to one array (ksystone)
  2. Install HBA driver & MPP
  3. Map 32 LUNs to the host
  4. Reboot the host
  5. After the host boots up, start I/O's to all the 32 LUNs
  6. Pull the Cable on CtlrB
  7. After the FW timer of 144secs expires, the HBA driver started removing the devices and that's when the HBA driver gave a Panic and the Panic stack is as follows with the EIP at  
"mptsas\_qcmd+0x8/0x28 [mptsas]"

**Description of Change:** Added a pointer sanity check in mptsas\_qcmd.

- **Issue:** Deletion/Creation of volumes after reboots results in doubled volume entries in SG

**Reported by:** Software Test

**To Reproduce:**

cfggen 0 create im 2000 0 1 qsync noprompt

cfggen 0 create ime 2000 2 3 4 5 noprompt

cfggen 0 hotspare 6

Reboot, and then run:

cfggen 0 delete noprompt

Then run the volume creation commands again.

View the SG device listing using "sg\_map -i -x". Where the primary drives should be listed will be listings for the volumes, in addition to the normal entries for the volumes later down in the list.

**Description of Change:** Additional handling of MPI\_EVENT\_RAID\_RC\_PHYSDISK events.

- **Issue:** After deleting an inactive volume, the driver does not re-add the disks

**Reported by:** Software Test

**To Reproduce:** Delete an inactive volume, the drives that were in that volume are not added by the driver.

According to 'dmesg', we receive the events for it, but they are just not added.

/proc/scsi/scsi and 'sg\_map -i -x' do not show any of the disks that were in the inactive volume.

**Description of Change:** Additional handling of MPI\_EVENT\_RAID\_RC\_PHYSDISK events.

- **Issue:** Taking way too long to recover from FAULT STATE

**Reported by:** Software Test

**To Reproduce:** Make filesystems on both volumes and start copies/compares between the two.

Pull the primary on the IM volume, wait 30 seconds after the volume has started resyncing with the hotspare and then pull the first drive of the IME volume. Wait for the IM volume to finish resyncing and then pull the third drive of the IME volume. 30 seconds later, pull the old hotspare. After pulling the old hotspare, the card blinks a 801f fault. Linux takes anywhere from 10–20 minutes to recover from the fault (entered as separate Linux issue #392). IO does not fail, and resumes after recovery from the fault.

**Description of Change:** In error handling threads, issue hard reset when this is not operational.

- **Issue:** CSMI: 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:** CSMI 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:** 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 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 03.03.12**

**Release Date:** 07/28/2006

### **General Changes**

#### **Functionality**

- Added CSMI IOCTL Support, v90
  - 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

## **Major Changes For Version 03.03.11**

**Release Date:** 07/14/2006

### **General Changes**

#### **Functionality**

- Adding v1.5.13 MPI Headers Updates.
- Adding 1078 Support.
- Transport Layer Retries support added – OEM specified cdb only for tape devices.
- Adding sas nexus loss support, also known as port down retry support.
- Adding support for sas enclosures with smart drives.

- Adding mpt\_cmd\_retry\_count – during hotadding device, the driver will issue test\_unit\_ready for waiting for end device to get into state to accept commands. The retry count is to specify how many retries.
- Adding mpt\_qas command line option – for disabling Quick Arbitration Select feature for entire host (only mptspi).
- Adding new debug prints for new sas loginfo : internal device reset, abort task set internal, clear task set internal, query task internal. Also adding new strings in iop\_code\_str[] and pl\_code\_str[].
- Initializing aen\_event\_read\_flag to zero after host reset.
- SAS hot plug remove handling: the target reset is moved from slave destroy to hotplug threads. The vtarget->deleted flag is used to prevent further IO to device.
- Removing 1066/1066E support pci device recognition.
- Removing mpt\_pq\_filter command line option.
- Converting pci device id's using the MPI\_MANUFACTURE\_DEVICEID\_XXX and MPI\_MANUFACTURE\_DEVID\_XXX defined in lsi/mpi\_cnfh.h.
- Remove MPI\_TARGET\_FLAGS\_VALID\_INQUIRY flag.
- Converting define SASDEBUG to MPT\_DEBUG\_SAS.
- Removing oem references.
- Returning IRQ\_NONE from interrupt handler to let upper layers know when driver didn't process the interrupt.
- SendEventAck, called when firmware sends an asyn event to driver. This routine was cleaned up.
- Fix's to insure download boot could occur when either channel of 1030 is reset. Necessary in order for onboard controller in flashless environment to become operational.

## Defect fixes

- **Issue:** Lack of Wide Port Support  
**Reported by:** Developer  
**To Reproduce:** Add wide target. The end device reported for each phy.

**Description of Change:** Wide Port Support (detection of wide/narrow ports, reporting end device once for every phy), adding debug level MPT\_DEBUG\_SAS\_WIDE, adding target alloc and destroy entry points.

- **Issue:** panic when loading mptctl at the same time as one of the fusion llds (mptsas/mptfc/mptspi)

**Reported by:** Customer

**To Reproduce:** Add wide target. The end device reported for each phy.

**Description of Change:** Fix in mpt\_device\_driver\_register, check for NULL pointer pcidev->driver.

- **Issue:** abort\_task reported success, when it actually failed.

**Reported by:** Developer

**To Reproduce:** Added hd->tm\_iocstatus flag in interrupt routine, and returns proper status

**Description of Change:** Additional sanity checks added to prevent scsi cmd from being double completed during error recovery.

## **Major Changes For Version 03.03.11**

**Release Date:** 07/14/2006

## **General Changes**

### **Functionality**

- SAS Transport Support
- SPI Transport Support (using generic domain validation)
- FC Transport Support

(This driver base stream created from 3.02.63)