Storage Components Group

Linux Driver Engineering Design Note

Title:	**Logging**	Date:	**12/26/2007**
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Product:	**Linux Driver**		

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REVISION HISTORY

REV	DATE	CHANGE	SECTION
A	12/26/07	INITIAL VERSION	

1.　OVERVIEW

This document defines how to enable/disable logging in the Linux driver. There are several levels of logging that can be enabled for various types of debugging. The logging is defined through bitwise variable with each bit representing a different type of logging. Multiple levels of logging can be enabled at the same time. The tuning of this variable can be done through a SysFS attributes. These bits can be toggled at any time without requiring a reboot. There is

also a command line option for logging at driver load time.   The logging level should be set using hexadecimal format.

2. REFERENCES

Mptdebug.h – This header file is included in the driver source code provided in the packaging.

3. DESIGN

3.1 Command Line Option

The command line option is available for those who need logging at driver load time.

Example:

insmod mptbase.ko mpt_debug_level=logging_level

Where logging_level is a hexadecimal number.

3.2 SysFS Option

The SysFS option can be set at anytime while the driver is loaded. There are two available methods for setting the logging level.

Setting global logging level for every host adapter:

echo logging_level > /sys/module/mptbase/parameters/mpt_debug_level

Setting logging level for single host:

echo logging_level > /sys/class/scsi_host/host0/debug_level

Where logging_level is a hexadecimal number.

3.3 Logging Levels

Below are the logging levels, and in parethensis the associated bitwise setting.

- MPT_DEBUG (0x00000001)
    Generic debug logging.

Logging

– MPT_DEBUG_MSG_FRAME (0x00000002)

Request and Reply Frame contents dumped in hexadecimal format. The MPT_DEBUG_VERBOSE define must be uncommented in driver Makefile, then the binaries recompiled.

– MPT_DEBUG_SG (0x00000004)

Scatter Gather info sent during SCSI_IO requests.

– MPT_DEBUG_EVENTS (0x00000008)

Firmware Events Reply translated in text format.

– MPT_DEBUG_VERBOSE_EVENTS (0x00000010)

Firmware Events Reply frame contents dumped in hexadecimal format.

– MPT_DEBUG_INIT (0x00000020)

Driver loading and initialization.

– MPT_DEBUG_EXIT (0x00000040)

Driver unloading.

– MPT_DEBUG_FAIL (0x00000080)

Various Failure cases.

– MPT_DEBUG_TM (0x00000100)

Task Management requests covering task_abort, target_reset, bus_reset, and host_reset.

– MPT_DEBUG_DV (0x00000200)

Requests sent when changing or reading device negotiation parameters. This is sent from spi transport layer during domain validation. This is only provided in mptspi driver.

– MPT_DEBUG_REPLY (0x00000400)

SCSI_IO request that return error.

– MPT_DEBUG_HANDSHAKE (0x00000800)

Logging of Handshake request. These normally occurring during driver load time, and host_reset.

- MPT_DEBUG_CONFIG (0x00001000)

    Manufature Configuration Pages sent and received.

- MPT_DEBUG_DL (0x00002000)

    Firmware upload and download, used for flashless environments.

- MPT_DEBUG_RESET (0x00008000)

    Diagnostic Reset.

- MPT_DEBUG_SCSI (0x00010000)

    Intended for SCSI request, however not currently in use.

- MPT_DEBUG_IOCTL (0x00020000)

    IOCTLS, for applications using mptctl.

- MPT_DEBUG_CSMISAS (0x00040000)

    Common Storage Management Interface, only for SAS, and applications using mptctl.

- MPT_DEBUG_FC (0x00080000)

    Fibre Channel, only for mptfc.

- MPT_DEBUG_SAS (0x00100000)

    SAS, only for mptsas.

- MPT_DEBUG_SAS_WIDE (0x00200000)

    SAS with specific details on wide port creation and deletion, only for mptsas.

- MPT_DEBUG_36GB_MEM (0x00400000)

    Errata for 1078, SAS controller. Special bits in the scatter gather list needing to be set during physical access in the 36GB memory range.

3.4   Examples

- Enable MPT_DEBUG_INIT at driver load time

insmod mptbase.ko mpt_debug_level=0x20

- Enable MPT_DEBUG_EVENTS and MPT_DEBUG_FAIL for every host

echo 0x88 > /sys/module/mptbase/parameters/mpt_debug_level

- Enable MPT_DEBUG_IOCTL and MPT_DEBUG_CSMISAS for single host0

echo 0x60000 > /sys/class/scsi_host/host0/debug_level