Contents

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Read This First

About This Manual

This document provides an overview and performance data for each of the device drivers which are part of the DaVinci Linux PSP package supporting DM644x, DM355, DM6467, DA830/OMAP-L137 and DA850/OMAP-L138. Note that only a subset of these platforms may have actually been tested and

verified in the package you are using. Please refer to the release notes provided with the package for information on which platforms have actually been verified.

If You Need Assistance

For further information or to report any problems, contact http://community.ti.com/ or http://support.ti.com/

Trademarks

DaVinci Linux Drivers

Abstract

This chapter provides brief details on the device drivers supported in the Linux PSP release based on Linux DaVinci git tree at http://git.kernel.org/?p=linux/kernel/git/khilman/linux-davinci.git

Note: The constraints may vary across product releases. Please refer to the Release Notes accompanying the release for an updated list of constraints.

DaVinci Linux PSP details

1. Supports EVM boards for DM644x, DM355, DM6467, DA830/OMAP-L137 and DA850/OMAP-L138.
2. Built with linux kernel version 2.6.29-rc8.
3. Compiled with code sourcery tool chain version arm-2008-q3.
4. Supports U-Boot version 2009.01
5. Supports boot from SPI and NAND flash.
6. Ships with sample root file system, ramdisk, pre-built u-boot, uImage binaries, sample applications and documentation.

Boot modes supported

Green colored box in the table below means that the particular boot mode is supported on the device.

Note: These are supported boot modes in PSP software, the actual hardware may support many more boot modes than shown here. Please refer to hardware documentation for list of all supported boot modes.

DaVinci Supported Boot Modes

Boot Mode	DM644x	DM6467	DM355	DA830/OMAP-L137	DA850/OMAP-L138
SPI EEPROM					
SPI Flash					
NAND Flash					
NOR Flash					
I2C EEPROM					

Device driver list

OMAP-L138 Peripheral Driver Support

Peripheral	Description	Linux driver type
Audio (McASP)	Audio Record and Playback	ALSA SoC
Ethernet	Transmit/receive network data. Supports Auto negotiation with 10/100 Mbps link speed	Netdev
USB MSC Host	USB Mass Storage Class Host Driver	Block
USB HID Host	USB Human Interface Device Host Driver	Input driver
USB MUSB HCD	MUSB Host controller driver	USB HCD

USB OHCI HCD	OHCI Host controller driver	USB HCD
NAND Flash	Flash storage system	MTD Character and Block
GLCD	Graphical LCD driver	Frame Buffer
SPI Flash	Flash storage system	MTD Character and Block
MMC/SD	Interface to MultiMedia Secure Digital cards	Block
UART	Serial Communication Interface	Character
I2C	Inter-IC Communication	Character
RTC	Real-time clock	Character
Watchdog	Watchdog Timer	Miscellaneous
SPI	Serial Peripheral Interface	Character
SATA	Serial ATA Interface	Block

Drivers not supported

1. SDIO - WLAN
2. McBSP character driver
3. VPIF (Video Port Interface)
4. VPBE, VPFE
5. UPP (Universal Parallel Port)
6. NOR Flash
7. Character LCD
8. Power Management (CPUFreq, CPUIdle)

ALSA SoC Audio Driver

Abstract

This chapter provides details on ALSA SoC audio driver along with throughput and CPU load numbers.

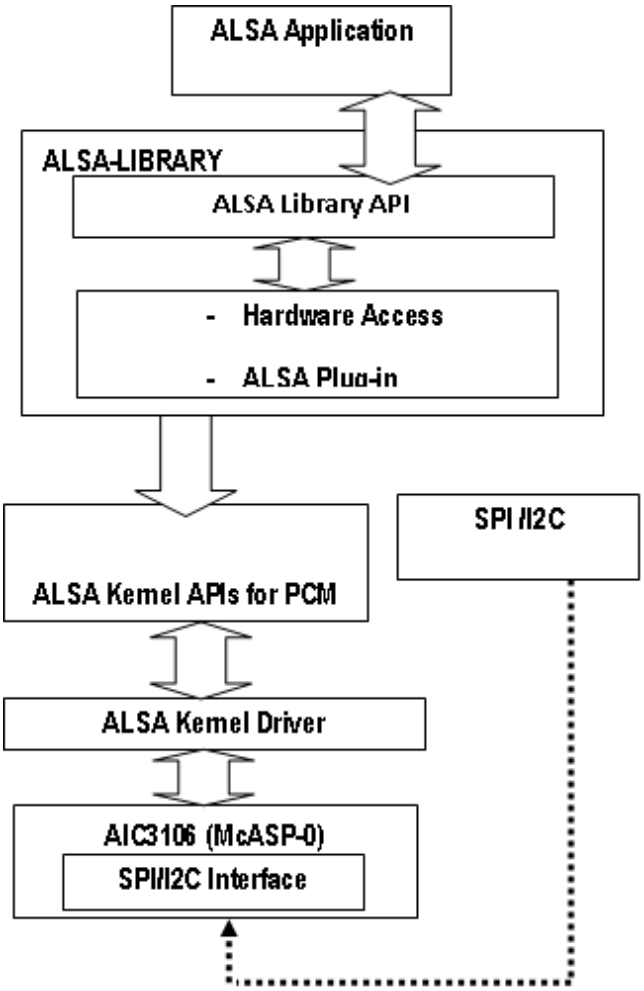
Introduction

DaVinci Audio driver complies to the Advanced Linux Sound Architecture (ALSA) System on Chip (SoC) framework (ASoC).

The ASoC framework splits an embedded audio system into three components:

- **Codec driver:** The codec driver is generic and hardware independent code that configures the audio codec to provide audio capture and playback. It should contain no code that is specific to the target platform or machine.
- **Platform driver:** The platform driver can be divided into audio DMA and SoC Digital Audio Interface (DAI) configuration and control. The platform driver only targets the SoC CPU and must have no board specific code.
- **Machine driver:** The ASoC machine (or board) driver is the code that glues together the platform and codec drivers. It can contain codec and platform specific code. It registers the audio subsystem with the kernel as a platform device.

Following architecture diagram shows all the components and the interactions among them:



Driver Features

1. The driver supports the following features:
2. Supports AIC32, AIC33, AIC3106 audio codec in ALSA SoC framework.
3. Multiple sample rate support (8 KHz, 44.1 KHz and 48 KHz commonly used) for both capture and playback.
4. Supports audio in stereo mode.
5. Supports simultaneous playback and record (full-duplex mode).
6. Start, stop, pause and resume feature.
7. Supports mixer interface for audio codecs.

Features Not Supported

1. Does NOT support OSS based applications using OSS emulation layer.
2. Does not support mono mode.

Constraints

- By default, codec is configured in master mode and McASP is used as slave. Testing of the audio sub-system is done in this configuration only.
- Configuration of playback and capture streams in different sampling rates is not supported.

Supported System Calls

Refer ALSA project - the C library reference [1] for API calls.

Supported IOCTLs

NA

Performance and Benchmarks

The performance numbers were captured using the following:

- Word length in bits = 16
- Number of channels per sample = 2
- Power Management = Disabled

DA850/OMAP-L138

Audio Write Performance

Sampling Rate (in Hz)	CPU Load (in %)
8000	NA
44100	NA
48000	NA

Audio Read Performance

Sampling Rate (in Hz)	CPU Load (in %)
8000	NA
44100	NA
48000	NA

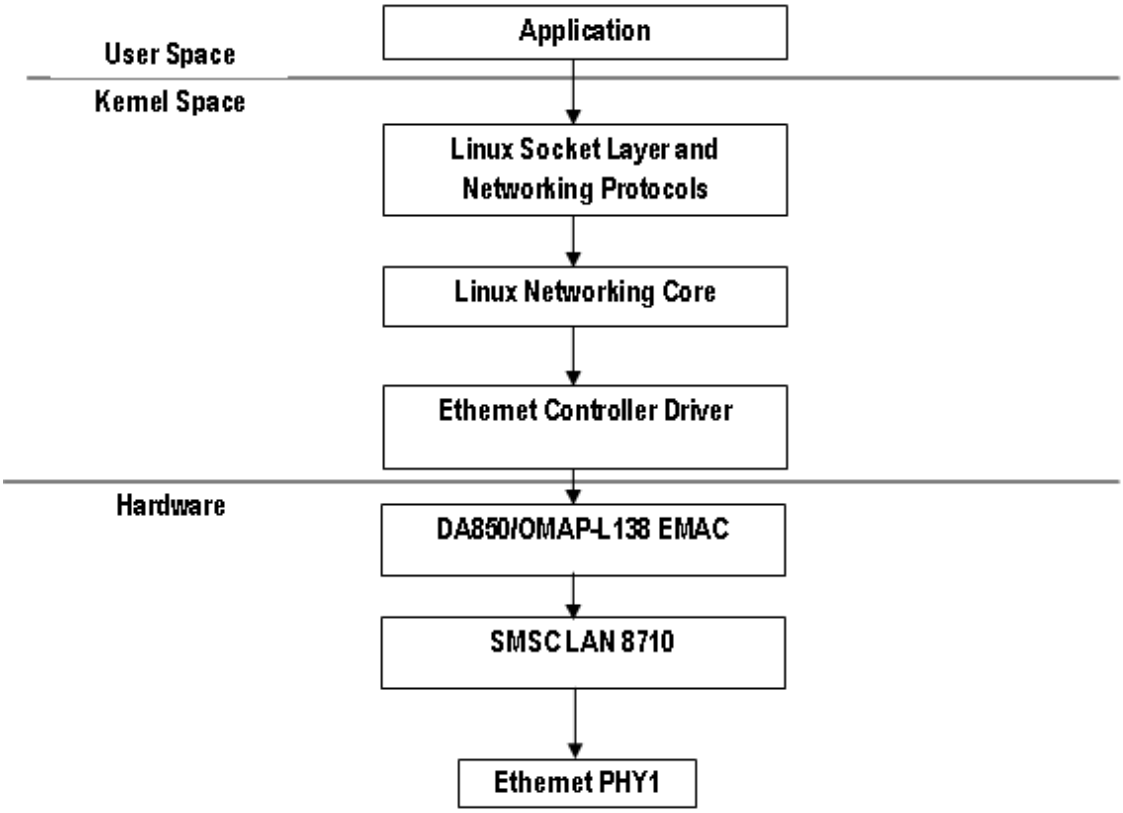
Ethernet Driver

Abstract

This chapter provides details on Ethernet driver along with throughput and CPU load numbers.

Introduction

The Ethernet driver supports the Linux netdev interface.



Driver Features

The driver supports the following features:

1. 10/100 Mbps mode of operation.
2. Auto negotiation.
3. Support for multicast and broadcast frames.
4. Promiscuous mode of operation.
5. Full duplex and half duplex mode of operation.
6. Linux NAPI support

Features Not Supported

NA

Constraints

NA

Supported System Calls

Supports the socket() and related system calls in accordance with Linux architecture.

Performance and Benchmarks

DA850/OMAP-L138

Ethernet 100Mbps Mode Performance

TCP Window Size(in KBytes)	Bandwidth (in Mbits/sec)	Transfer size (in MBytes)	Interval (in Seconds)
16	58.3	417	60
32	65.7	470	60
64	65.8	471	60
128	67.5	483	60

The performance numbers were captured using the iperf tool. Usage details are mentioned below:

- Server side command switch : "-s"
- Client side command : "-c <server ip> -w <window size> -d -t60"
- Iperf tool is run on the DUT1 in server mode and on DUT2 in client mode. Version 1.7.0 is used on both sides.
- Data captured here is for "iperf" in client mode.
- Cross cable is used to measure performance.
- Speed is set to 100Mbps
- Power Management disabled for measurement

Graphical LCD (GLCD) Driver

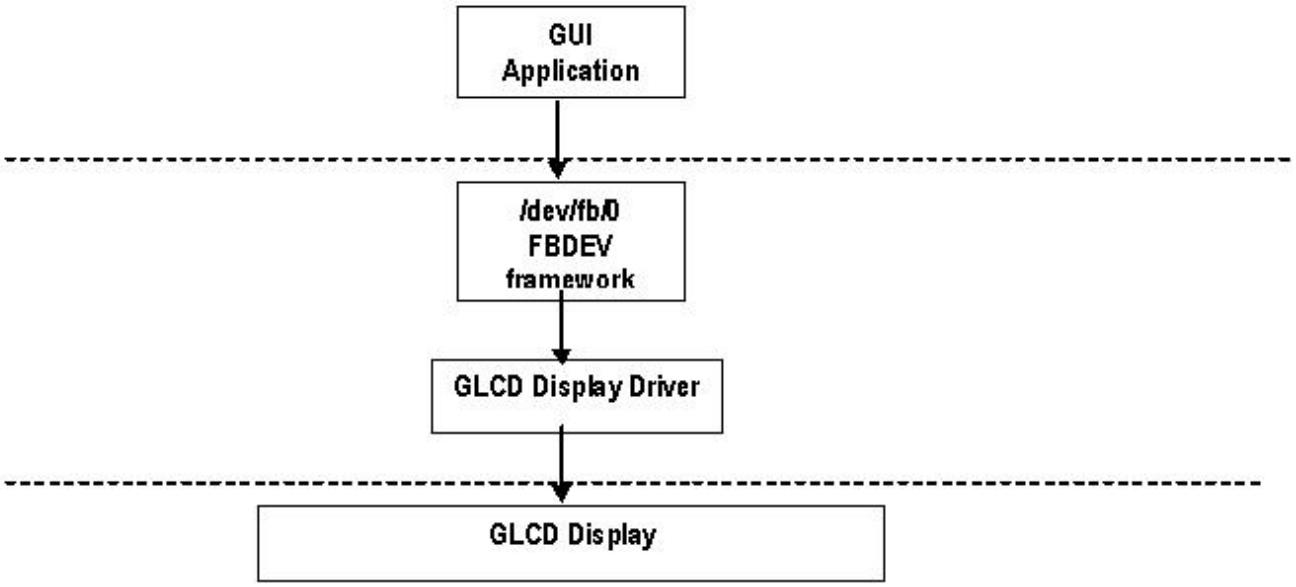
Abstract

This chapter describes the GLCD driver architecture, driver features and performance numbers (throughput and CPU load).

Introduction

GLCD driver is based on Fbdev framework.

Note: OMAP-L138/OMAP-L137 EVM does not have Graphical LCD populated. OMAP-L138/OMAP-L137 SoC, however, supports interfacing to Graphical LCD through LCDC controller.



Driver Features

1. Supports QVGA display through Fbdev framework.
2. Supports display of RGB565 images.
3. Supports getting and setting the variable screen information.
4. Supports retrieving the fixed screen information.

Features Not Supported

1. WAITFORVSYNC ioctl not supported.
2. Panning not supported.
3. Brightness and color control ioctls not supported.

Constraints

1. Driver doesn't support double buffering.

Supported System Calls

```
open(), close(), read(), mmap(), ioctl()
```

Performance Benchmarks

NAND Driver

Abstract

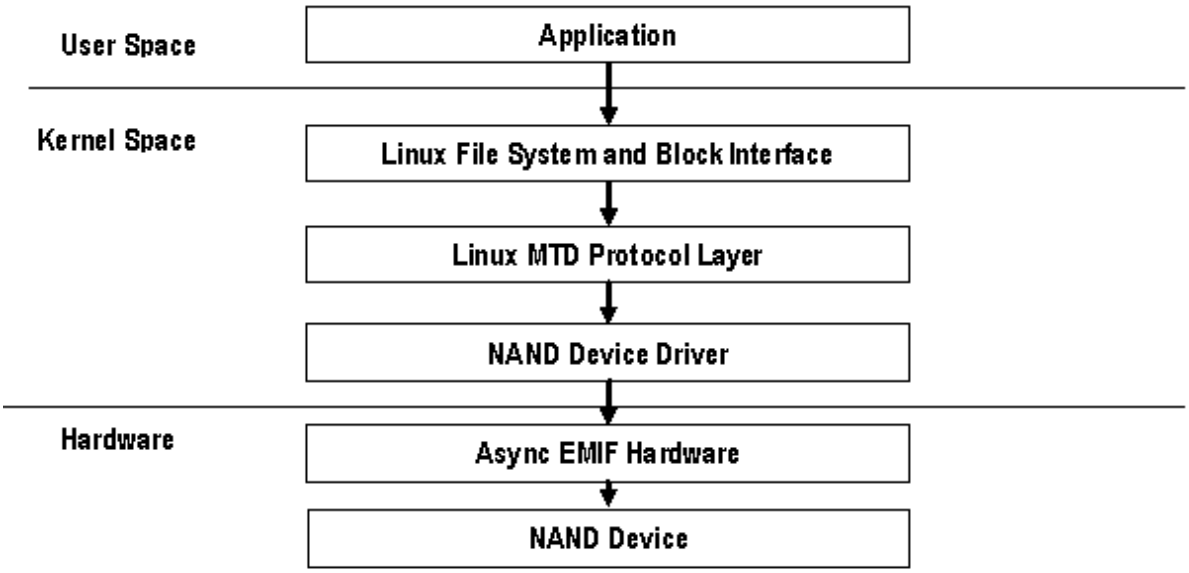
This chapter describes the NAND flash driver architecture, driver features and performance numbers (throughput and CPU load).

Introduction

The NAND driver is implemented as a block driver, compliant with the standard MTD driver. It supports various NAND Flash chips (see drivers/mtd/nand/nand_ids.h file.) The NAND driver creates the device nodes for user space access (/dev/mtdblock0, /dev/mtdblock1, /dev/mtd0,/dev/mtd1 and so on.).

Note: OMAP-L138/OMAP-L137 EVM does not have NAND flash populated. OMAP-L138/OMAP-L137 SoC, however, supports interfacing to NAND flash through Async EMIF interface.

This figure illustrates the stack diagram of NAND flash driver in Linux.



Driver Features

The driver supports the following features:

1. JFFS2 file system
2. Supports Read, Write and Erase
3. Bad Block Management
4. Polled mode of transfer
5. Small Block (512 bytes), Big Block (2K & 4K bytes), SLC NAND

Features Not Supported

None

Constraints

None

Supported System Calls

Supports the system call support proivided by MTD interface viz. `open(), close(), read(), write(), ioctl()`

Performance Benchmarks

DA850/OMAP-L138

NAND write performance values

Buffer Size (in KBytes)	Total Bytes Transferred (in MBytes)	Transfer Rate (in MBytes/sec)	CPU Load (in %)
100	3	1.10	100
256	3	1.16	100
512	3	0.92	100
1024	3	1.02	100
5120	3	1.11	100

NAND read performance values

Buffer Size (in KBytes)	Total Bytes Transferred (in MBytes)	Transfer Rate (in MBytes/sec)	CPU Load (in %)
100	3	66.40	100
256	3	68.03	100
512	3	62.41	100
1024	3	57.68	100
5120	3	46.21	100

The performance numbers are captured using the following:

1. NAND PART Number: Micron MT29F4G08AAC
2. Power Management disabled.
3. File System = JFFS2

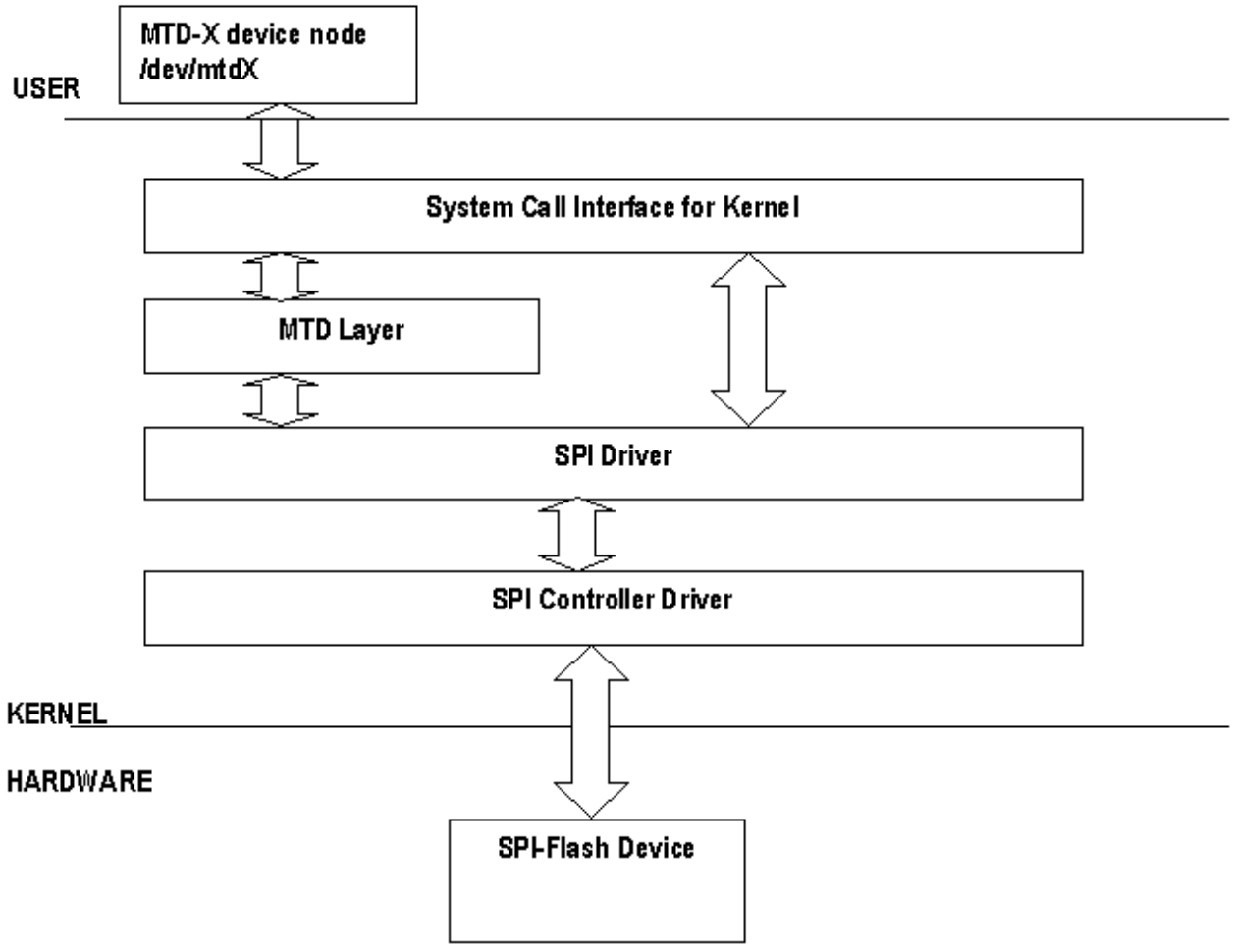
SPI Flash Driver

Abstract

This chapter describes the SPI flash driver architecture, driver features and performance numbers (throughput and CPU load).

Introduction

SPI Flash driver is implemented as block driver and compliant with standard MTD driver. It supports various flash devices. The SPI driver creates device node for user space access (example, /dev/mtd1).



Driver Features

- DMA and PIO modes are supported.

Features Not Supported

None

Constraints

None

Supported System Calls

Supports the system call support proivided by MTD interface viz. `open(), close(), read(), write(), ioctl()`

Performance Benchmarks

DA850/OMAP-L138

SPI write performance values

Buffer Size (in KBytes)	Mega Bytes/sec	FileSize in MB	Duration in sec
16	0.08	7	96.46
32	0.47	7	15.76
64	0.45	7	16.42
1024	0.45	7	16.41

SPI read performance values

Buffer Size (in KBytes)	Mega Bytes/sec	FileSize in MB	Duration in sec
16	67.02	7	0.10
32	66.10	7	0.11
64	70.20	7	0.10
1024	64.67	7	0.11

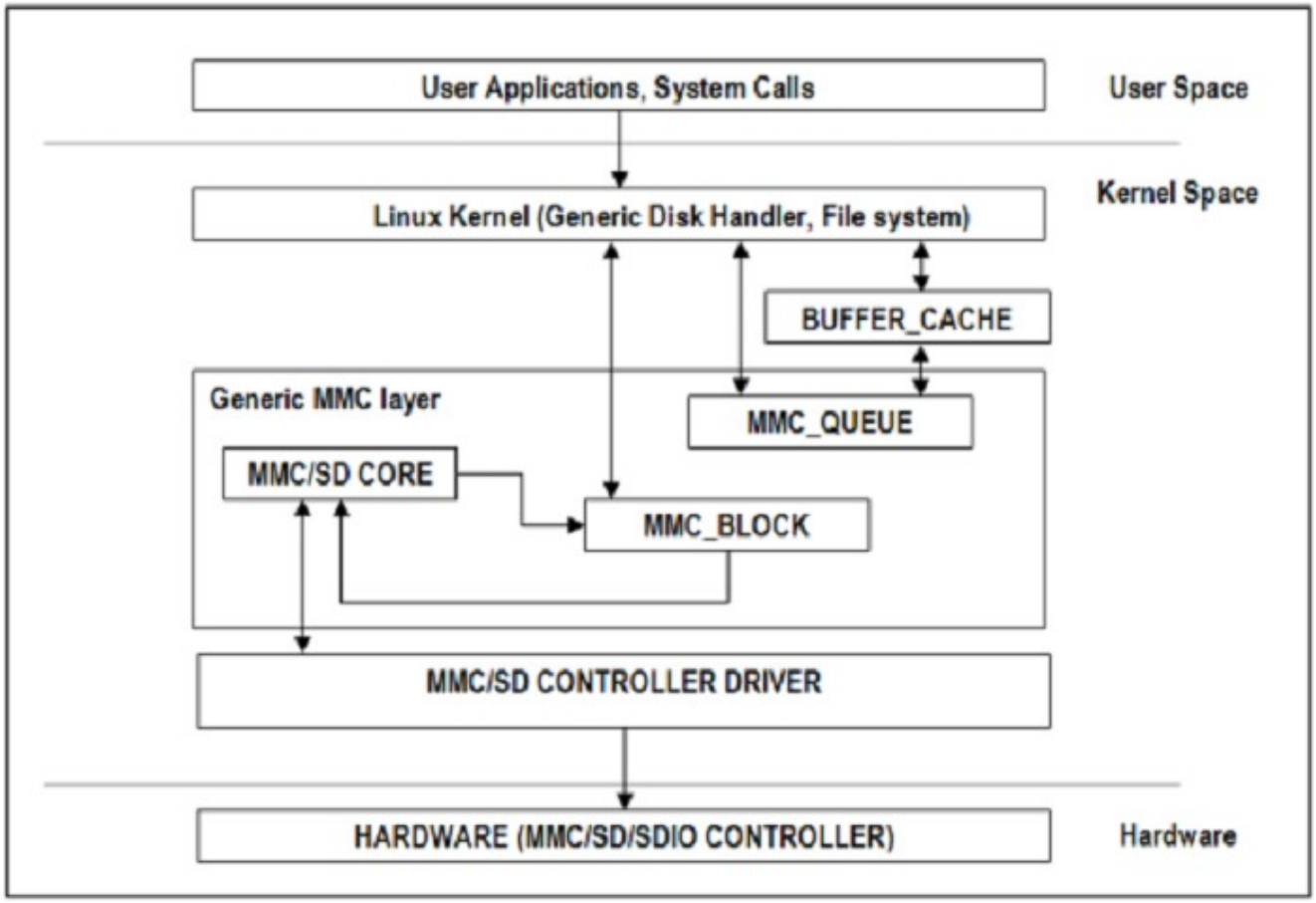
MMC/SD Driver

Abstract

This chapter provides details on MMC/SD driver along with throughput and CPU load numbers.

Introduction

The MMC controller provides an interface to external MMC cards that follow the MMC specification v4.0. The MMC driver is implemented as a block driver. Block device nodes(such as /dev/mmcblockp1, /dev/mmcblockp2) are created for user space access.



Driver Features

The driver supports the following features:

1. MMC/SD native protocol command/response set
2. Single/multiple block data transfers
3. Linux file system and generic MMC layer abstract details of block devices (MMC)
4. High-speed (SDv1.1) and High Capacity (SDv2.0) cards
5. Support for 1/4 bit modes
6. Support for card detect and Write protect features
7. DMA and polled mode for data transfer operations

Features Not Supported

1. Support for 8-bit mode of operation.
2. SDIO - WLAN support
3. SPI mode of operation

Constraints

1. MMC/SD cards should not be removed when the mount operation is in progress. If done so, data integrity cannot be guaranteed.
2. rmmod of MMC/SD driver results in kernel crash.

Supported System Calls

```
open(),close(),read(),write()
```

Supported IOCTLs

None

Performance and Benchmarks

Important

The performance numbers can be severely affected if the media is mounted in sync mode. Hot plug scripts in the filesystem mount removable media in sync mode to ensure data integrity. For performance sensitive applications, umount the auto-mounted filesystem and re-mount in async mode.

DA850/OMAP-L138

Performance using EXT2 file system

Read performance values

Buffer Size (in KBytes)	Total Bytes Transferred (in MBytes)	Transfer Rate (in MBytes/sec)	CPU Load (in %)
100	100	7.03	26.01
256	100	7.41	25.97
512	100	7.42	28.96
1024	100	7.38	28.58
5120	100	7.38	26.75

Write performance values

Buffer Size (in KBytes)	Total Bytes Transferred (in MBytes)	Transfer Rate (in MBytes/sec)	CPU Load (in %)
100	100	1.47	17.76
256	100	2.15	15.67
512	100	2.15	15.88
1024	100	2.15	15.67
5120	100	2.16	16.24

The performance numbers were captured using the following:

- SD Card (Transcend, 512MB)
- Power Management: Disabled
- File System: ext2

Performance using VFAT file system

Read performance values

Buffer Size (in KBytes)	Total Bytes Transferred (in MBytes)	Transfer Rate (in MBytes/sec)	CPU Load (in %)
100	100	7.33	24.25
256	100	7.05	22.78
512	100	7.44	23.85
1024	100	7.50	24.70
5120	100	7.47	24.88

Write performance values

Buffer Size (in KBytes)	Total Bytes Transferred (in MBytes)	Transfer Rate (in MBytes/sec)	CPU Load (in %)
100	100	2.07	22.26
256	100	2.08	18.43
512	100	2.08	18.18
1024	100	2.11	17.38
5120	100	2.10	17.92

The performance numbers were captured using the following:

- SD Card (Transcend, 512MB)
- Power Management: Disabled
- File System: VFAT

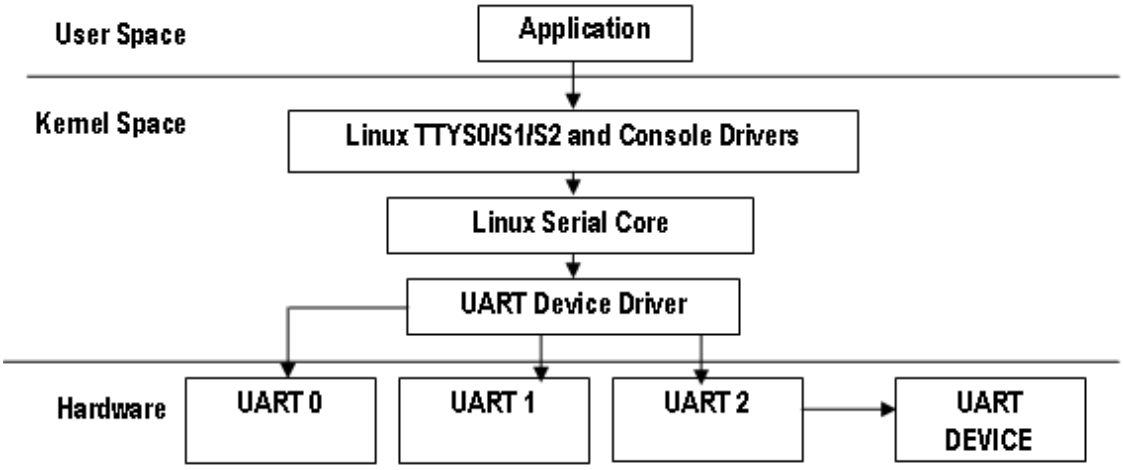
UART Driver

Abstract

This chapter provides details on UART driver along with throughput and CPU load numbers.

Introduction

The UART driver is implemented as a serial driver, and can be accessed from user space as /dev/ttyS2.



Driver Features

The driver supports the following features:

1. UART2 is physically available on Board

Features Not Supported

- None

Constraints

None

Supported System Calls

`open(),close(),read(),write(),ioctl()`

Supported IOCTLs

Constant	Description
TIOCGSERIAL	Gets device parameters from the UART (example, port type, port num, baud rate, base divisor, and so on.

TIOCSSERIAL	Sets UART device parameters (example, port type, port num, baud rate, base divisor, and so on)

Performance and Benchmarks

DA850/OMAP-L138

Write performance values

Transmit Size in Bytes	bits/sec	Buffer Size in Bytes	Duration in sec
102400	NA	1024	NA
204800	NA	1024	NA
307200	NA	1024	NA
409600	NA	1024	NA

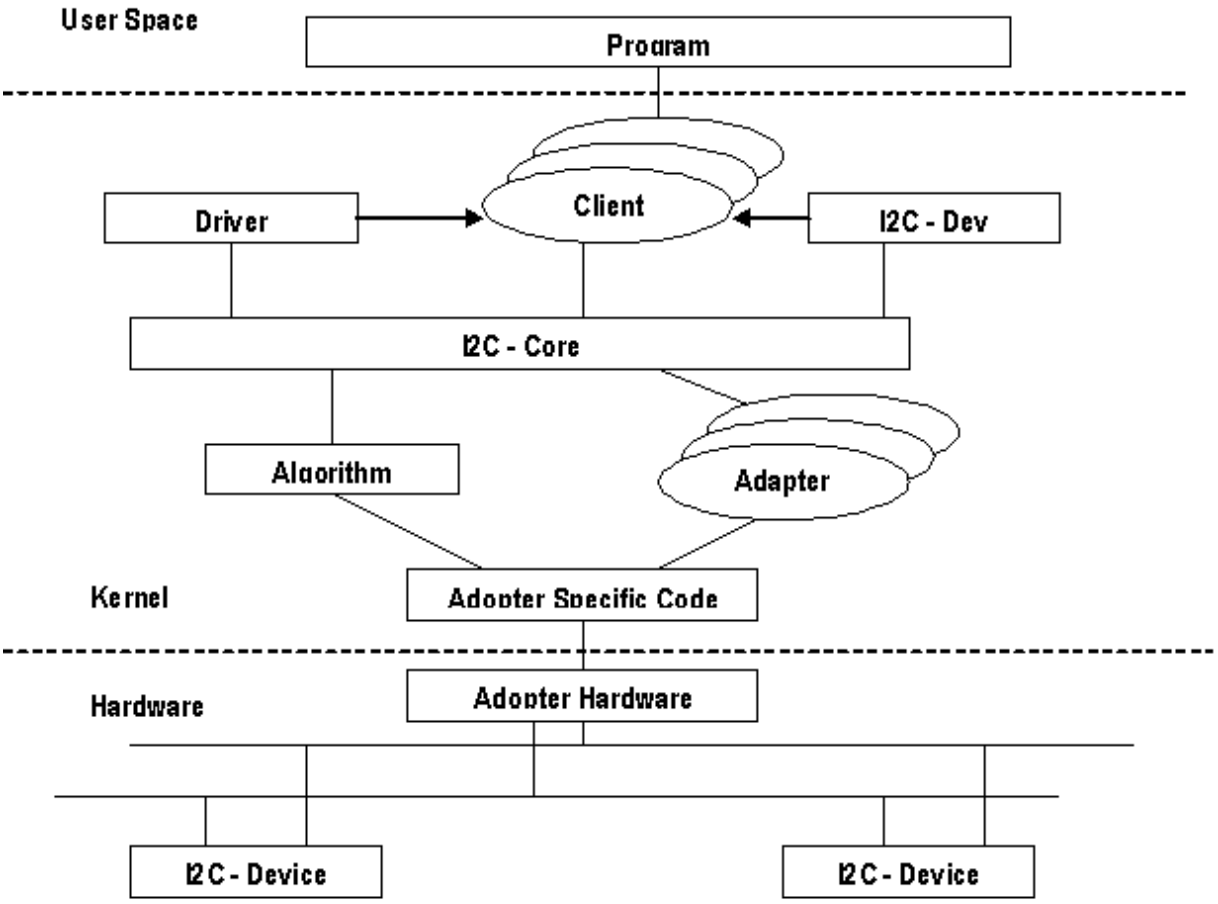
I2C Driver

Abstract

This chapter provides details on I2C driver along with throughput and CPU load numbers.

Introduction

The I2C peripheral is compliant with the Philips Semiconductor I2C-bus specification version 2.1. The I2C driver is implemented as a serial driver. The I2C driver can be accessed from the user space as /dev/i2c/0.



Driver Features

The driver supports the following features:

1. 7-bit addressing mode
2. Fast mode
3. Interrupt mode

Features Not Supported

1. 7-bit and 10-bit addressing combined format is not supported
2. DMA mode is not supported

Constraints

- None

Supported System Calls

```
open(),close(),read(),write(),ioctl()
```

Supported IOCTLs

Constant	Description
I2C_SLAVE_FORCE	Changes slave address. Slave address is 7 or 10 bits. This changes the address, even if it is already considered.
I2C_TENBIT	7- or 10-bit address. (Value = 0 for 7 bits; value != 0 for 10 bits.)
I2C_FUNCS	Gets the adapter functionality
I2C_RDWR	Combined R/W transfer (one stop only)

Performance and Benchmarks

DA850/OMAP-L138

Read performance values

Buffer Size in Bytes	Data rate - Kbits/s	Total Buffer Size in Bytes	Duration in uSec
16	NA	1024	NA
32	NA	1024	NA
64	NA	1024	NA
128	NA	1024	NA
1024	NA	1024	NA

Write performance values

Buffer Size in Bytes	Data rate - Kbits/s	Total Buffer Size in Bytes	Duration in uSec
16	NA	1024	NA
32	NA	1024	NA
64	NA	1024	NA
128	NA	1024	NA
1024	NA	1024	NA

EDMA Driver

Abstract

This chapter provides details on EDMA driver along with throughput and CPU load numbers.

Introduction

The EDMA controller handles all data transfers between the level-two (L2) cache/memory controller and the device peripherals. On DA850/OMAPL138 EDMA has 2 CC instances where as the other SoCs have one instance. Each EDMA instance supports up to 32-dma channels and 8 QDMA channels. The EDMA consists of a scalable Parameter RAM (PaRAM) that supports flexible ping-pong, circular buffering, channel-chaining, auto-reloading, and memory protection. The EDMA allows movement of data to/from any addressable memory spaces, including internal memory (L2 SRAM), peripherals, and external memory.

The EDMA driver exposes only the kernel level API's. This driver is used as a utility by other drivers for data transfer.

Driver Features

The driver supports the following features:

1. Request and Free DMA channel
2. Programs DMA channel
3. Start and Synchronize with DMA transfers
4. Provides DMA transaction completion callback to applications
5. Multiple instances of EDMA driver on a single processor
6. Read/Write a specific CC register
7. Polled Mode DMA Transfers

Features Not Supported

1. QDMA is not supported.

Constraints

None

Supported System Calls

None

Supported IOCTLs

None

Performance and Benchmarks

NA

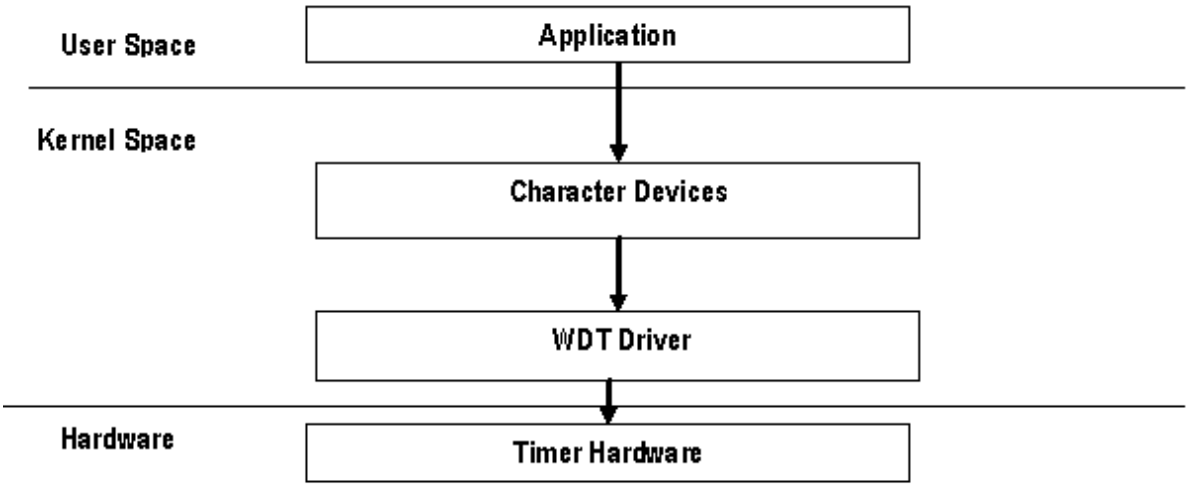
Watchdog(WDT) Driver

Abstract

This chapter provides details on WDT driver along with throughput and CPU load numbers.

Introduction

DaVinci SoCs have a 64-bit watchdog timer which can be used to reset the hardware in case of a software fault. Once the /dev/watchdog is opened, it will reboot the system unless a user space daemon resets the timer at regular intervals within a certain timeout period. The WDT driver is registered as a misc device. Default timeout of this driver is 60 seconds.



Driver Features

The driver supports the following features:

1. Supports IOCTLs to set/get the timeout value, ping the watchdog & query the watchdog structure info.
2. Driver can be built as a loadable module and inserted dynamically.

Features Not Supported

- None

Constraints

1. Once /dev/watchdog is opened, closing it doesn't disable the watchdog

Supported System Calls

```
open(), close(), write(), read()
```

Supported IOCTLs

Constant	Description
WDIOC_GETSUPPORT	This ioctl returns "struct watchdog_info", which tells what the device can do
WDIO_KEEPALIVE	This ioctl can be used to notify the watchdog timer that the user space application is alive
WDIO_SETTIMEOUT	Watchdog timeout or margin can be dynamically changed using this ioctl
WDIO_GETTIMEOUT	This ioctl returns the present watchdog timeout period in seconds

Performance and Benchmarks

None

USB Driver

Abstract

This chapter provides details on OHCI and MUSB drivers along with throughput and CPU load numbers.

This chapter describes the USB (EHCI and MUSB) driver architecture, features supported/not supported, constraints and performance numbers.

OHCI Controller

Driver Features

The driver supports the following feature

1. Human Interface Class (HID)
2. Mass Storage Class (MSC)
3. Hub Class

Features Not Supported

ISO transfers

MUSB OTG controller

Description

The MUSB driver is implemented on top of Mentor OTG IP version 1.8 which supports all the speeds (High, Full and Low (host mode only)). On DA830/OMAP-L137 and DA850/OMAP-L138, MUSB uses CPPI 4.1 DMA for all the transfers on other devices CPPI 3.0 DMA is used.

Driver Features

The driver supports the following feature

Host Mode

1. Human Interface Class (HID)
2. Mass Storage Class (MSC)
3. Hub Class
4. ISO Video Class (UVC)

Gadget mode

1. Mass Storage Class (MSC)

Features Not Supported

Host Mode

1. ISO - Audio transfers

Device Mode

1. RNDIS/CDC

OTG

USB Mass Storage Class Host Driver

Driver Features

The driver supports the following feature

1. DMA mode
2. PIO mode

Features Not Supported

None

Constraint

None

Supported System Calls

```
open(), close(), read(), write(), ioctl()
```

Supported IOCTLS

None

Performance Benchmarks

Important

For Mass-storage applications, the performance numbers can be severely affected if the media is mounted in sync mode. Hot plug scripts in the filesystem mount removable media in sync mode to ensure data integrity. For performance sensitive applications, umount the auto-mounted filesystem and re-mount in async mode.

DA850/OMAP-L138

USB MSC (MUSB) Host mode DMA Ext2 File System Performance

USB-MSC MUSB Host-DMA-Write Performance values

Buffer Size (in KBytes)	Total Bytes Transferred (in MBytes)	Transfer Rate (in MBytes/sec)	CPU Load (in %)
100	100	12.3	62
500	100	13.6	66
1024	100	13.9	60
5120	100	14.3	82

USB-MSC MUSB Host-DMA-Read Performance values

Buffer Size (in KBytes)	Total Bytes Transferred (in MBytes)	Transfer Rate (in MBytes/sec)	CPU Load (in %)
100	100	17.8	72
256	100	17.6	69
512	100	17.5	67
1024	100	17.3	73

The performance numbers are captured using the following.

1. Hard disk: Mobile Disk
2. File format: ext2
3. Power Management: Disabled

USB MSC (MUSB) Host mode DMA VFAT File System Performance

USB-MSC MUSB Host-DMA-Write Performance values

Buffer Size (in KBytes)	Total Bytes Transferred (in MBytes)	Transfer Rate (in MBytes/sec)	CPU Load (in %)
100	100	13	100
500	100	13	100
1024	100	13	100
5120	100	13	100

USB-MSC MUSB Host-DMA-Read Performance values

Buffer Size (in KBytes)	Total Bytes Transferred (in MBytes)	Transfer Rate (in MBytes/sec)	CPU Load (in %)
100	100	17.5	76
500	100	17	75
1024	100	17.5	75
5120	100	16.5	67

The performance numbers are captured using the following.

1. Hard disk: Mobile Disk
2. File format: vfat
3. Power Management: Disabled

USB MSC (OHCI) Host mode DMA Ext2 File System Performance

USB-MSC OHCI Host-DMA-Write Performance values

Buffer Size (in KBytes)	Total Bytes Transferred (in MBytes)	Transfer Rate (in MBytes/sec)	CPU Load (in %)
100	50	0.99	3.5
500	50	0.99	3.5
1024	50	0.99	4.5
5120	50	0.99	4.5

USB-MSC OHCI Host-DMA-Write Performance values

Buffer Size (in KBytes)	Total Bytes Transferred (in MBytes)	Transfer Rate (in MBytes/sec)	CPU Load (in %)
100	50	0.90	4.75
512	50	0.90	4.6
1024	50	0.90	4.2
5120	50	0.90	4

The performance numbers are captured using the following.

1. Hard disk: Mobile Disk
2. File format: ext2
3. Power Management: Disabled

USB MSC (OHCI) Host mode DMA VFAT File System Performance

USB-MSC OHCI Host-DMA-Write Performance values

Buffer Size (in KBytes)	Total Bytes Transferred (in MBytes)	Transfer Rate (in MBytes/sec)	CPU Load (in %)
100	50	0.87	8.6
500	50	0.88	5.1
1024	50	0.89	6.7
5120	50	0.89	5.7

USB-MSC OHCI Host-DMA-Read Performance values

Buffer Size (in KBytes)	Total Bytes Transferred (in MBytes)	Transfer Rate (in MBytes/sec)	CPU Load (in %)

100	50	0.99	5
500	50	0.99	3.3
1024	50	0.99	5
5120	50	0.99	5

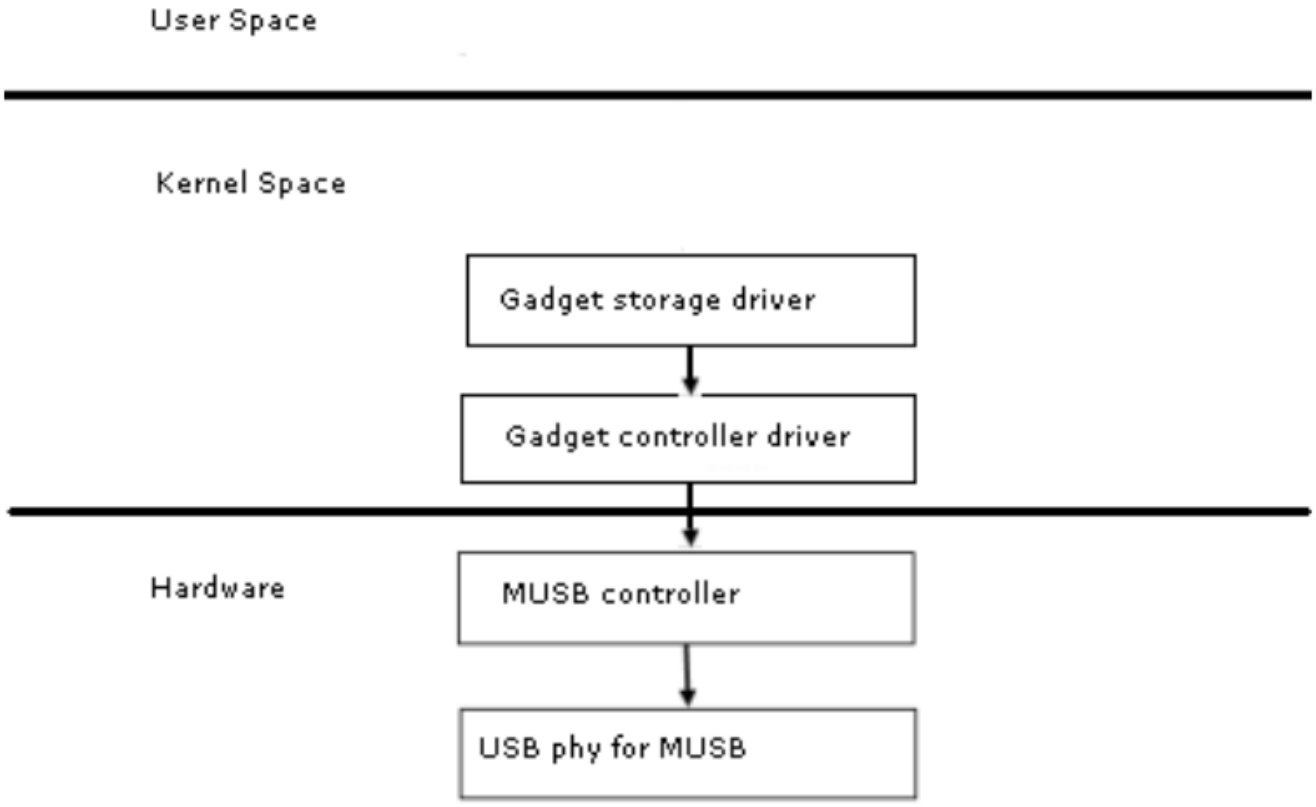
The performance numbers are captured using the following.

1. Hard disk: Mobile Disk
2. File format: vfat
3. Power Management: Disabled

USB Mass Storage Class Slave Driver

Description

This figure illustrates the stack diagram of the system with USB File Storage Gadget driver



Driver Features

The driver supports the following feature

1. DMA mode
2. PIO mode
3. File backed storage driver was tested with SD media as the storage medium

Features Not Supported

None

Constraint

None

Supported System Calls

NA

Supported IOCTLS

NA

Performance Benchmarks

DA850/OMAP-L138

USB Slave-DMA Performance

USB Slave-DMA-Read Performance values

Bytes Transferred (MB)	Number of files transferred	Total Bytes transferred (MB)	Data Rate (MB/sec)
1024	1	1024	13

USB Slave-DMA-Write Performance values

Bytes Transferred (MB)	Number of files transferred	Total Bytes transferred (MB)	Data Rate (MB/sec)
1024	1	1024	6

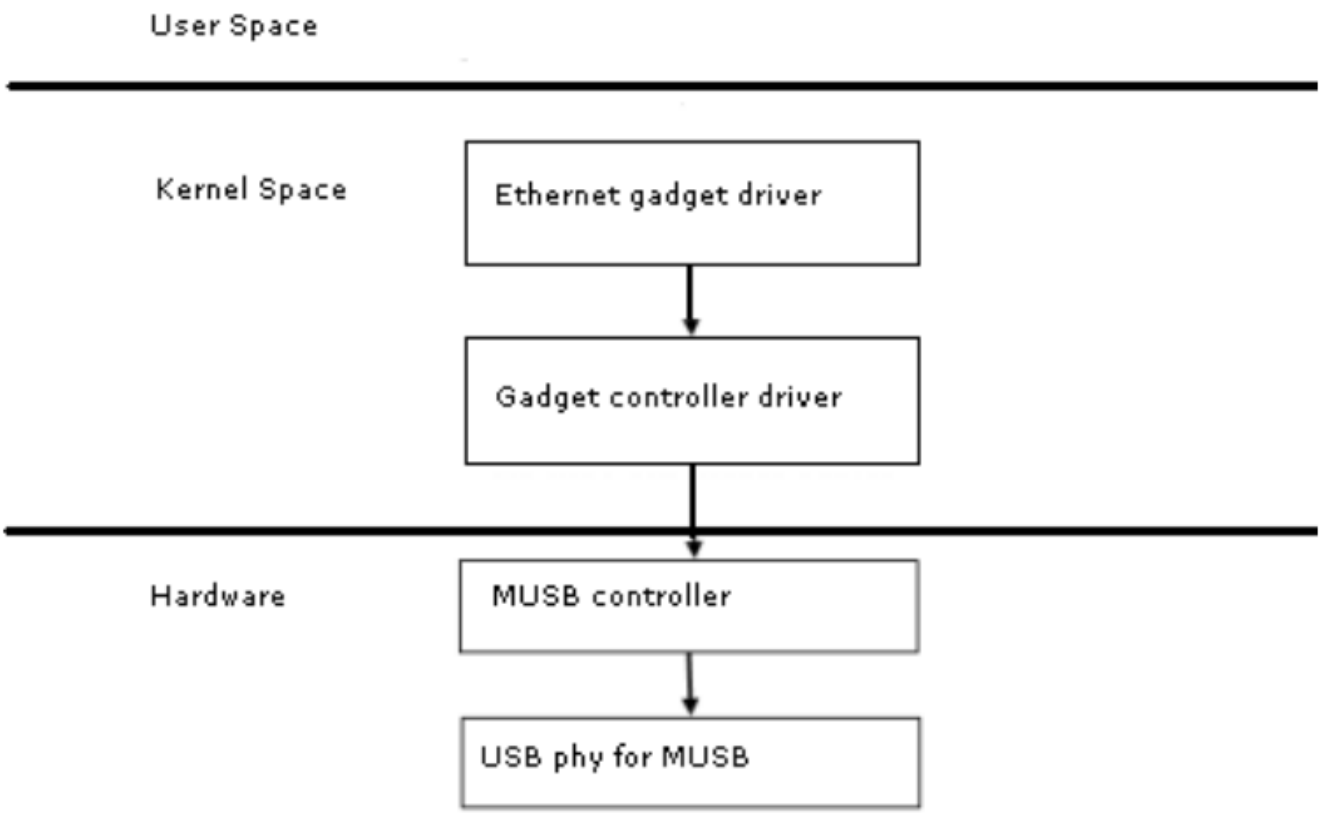
The performance numbers are captured using the following.

1. SATA HDD - Seagate Baracuda 7200 RPM 500GB drive
2. File format: vfat on Windows XP
3. Power Management: off

USB CDC/RNDIS Slave Driver

Description

The CDC RNDIS gadget driver that is used to send standard Ethernet frames using USB. The driver will create an Ethernet device by the name usb0.



Driver Features

The driver supports the following feature

1. DMA mode
2. PIO mode
3. 10/100 Mbps speed.

Features Not Supported

None

Constraint

None

Supported System Calls

`open(), close(), read(), write(), ioctl()`

Supported IOCTLS

None

Performance Benchmarks

USB CDC-DMA Performance

USB CDC-DMA Performance values

TCP window size (in KBytes)	Bandwidth (Mbits/Sec)	Transfer size (in Mbytes)	Interval (in sec)
16	NA	NA	60
32	NA	NA	60
64	NA	NA	60
128	NA	NA	60
208	NA	NA	60

USB RNDIS-DMA Performance

USB RNDIS-DMA Performance values

TCP window size (in KBytes)	Bandwidth (Mbits/Sec)	Transfer size (in Mbytes)	Interval (in sec)
16	NA	NA	60
32	NA	NA	60
64	NA	NA	60
128	NA	NA	60
208	NA	NA	60

USB Human Interface Device (HID) Driver

Description

The event sub system creates /dev/input/event* devices with the help of mdev.

Driver Features

The driver supports the following feature

1. DMA mode
2. PIO mode
3. USB Mouse and Keyboards that conform to the USB HID specifications

Features Not Supported

None

Constraint

None

Supported System Calls

NA

Supported IOCTLS

NA

Performance Benchmarks

NA

USB Isochronous Driver

Description

USB camera, speaker and mic uses isochronouse transfers. USB Video Class (UVC) is used by most of the USB cameras to capture image.

Driver Features

The driver supports the following feature

1. DMA mode
2. PIO mode
3. Support for USB Audio and video class(UVC class)
4. Support for high bandwidth isochronous transfer

Features Not Supported

None

Constraint

None

Supported System Calls

NA

Supported IOCTLS

NA

Performance Benchmarks

NA

USB OTG Driver

Description

MUSB controller on DaVinci supports USB On The Go (OTG). OTG protocol enables runtime role switch between USB host and device. This is achived using Session Request Protocol (SRP) and Host Negotiation Protocol (HNP). OTG driver is tested with OPT (OTG Protocol Tester).

Driver Features

The driver supports the following feature

1. Both HNP and SRP are supported

Features Not Supported

None

Constraint

None

Supported System Calls

NA

Supported IOCTLS

NA

Performance Benchmarks

NA

SATA

Description

SATA peripheral is AHCI Ver.1.1 spec compliant peripheral. It supports SATA1 (150MBps) and SATA 2 (300MBps) speeds over one SATA port. Port Multiplier support is available in the SATA controller. The controller can support drives upto UDMA-133 speeds.

Driver Features

Registers as a SCSI controller with the Linux SCSI Subsystem. SATA devices get registered as SCSI devices and can be accessed as "/dev/sd{*}" devices.

Driver Features Not Supported

Port Multiplier support.

Constraint

None

Supported System Calls

NA

Supported IOCTLS

NA

Performance Benchmarks

SATA - VFAT File System Performance

SATA - Write Performance values

Buffer Size (in KBytes)	Total Bytes Transferred (in MBytes)	Transfer Rate (in MBytes/sec)	CPU Load (in %)
100	100	18	100
500	100	19	100
1024	100	16.5	90
5120	100	19	100

SATA - VFAT File System Performance =

SATA - Read Performance values

Buffer Size (in KBytes)	Total Bytes Transferred (in MBytes)	Transfer Rate (in MBytes/sec)	CPU Load (in %)
100	100	32	100
500	100	33	97
1024	100	32	98.75
5120	100	32	96

The performance numbers are captured using the following.

1. SATA HDD - Seagate Baracuda 7200 RPM 500GB drive
2. File format: vfat
3. Power Management: off