AM335x MMC/SD Driver's Guide

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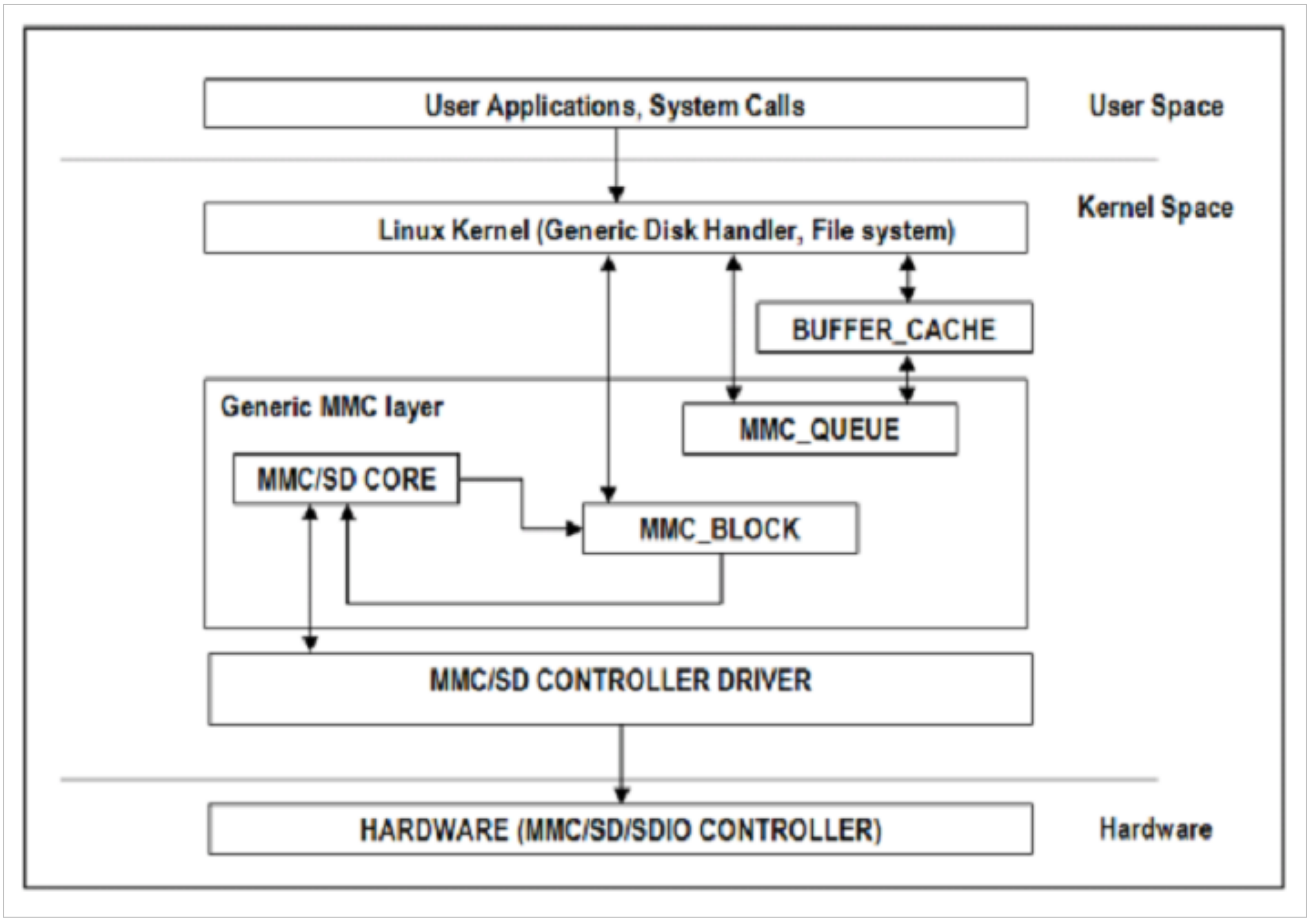
Linux PSP

Introduction

AM335x has 3 instances MMC/SD/SDIO host controller, which provides an interface between microprocessor and either MMC, SD memory cards, or SDIO cards. The current version of the user guide talks about the MMC/SD controller.

The MMC/SD driver is implemented as a block driver on top of host controller as a HSMMC controller driver and supports SD, SD High Speed and SDHC cards. This driver only supports for 4 bit modes(no SPI mode, 1/8 Bit). Both DMA & polled mode of data transfer is supported.

MMC/SD Driver Architecture



Useful Links

1. [MMCA Homepage [1]]
2. [SD ORG Homepage [2]]

Acronyms & Definitions

Audio Driver: Acronyms

Acronym	Definition
MMC	Multimedia Card
HS-MMC	High Speed MMC
SD	Secure Digital
SDHC	SD High Capacity
SDIO	SD Input/Output

Driver Configuration

The default kernel configuration enables support for MMC/SD(built-in to kernel). OMAP MMC/SD driver is reused for AM335x.

The selection of MMC/SD/SDIO driver can be modified as follows: start Linux Kernel Configuration tool.

```
$ make CROSS_COMPILE=arm-arago-linux-gnueabi- ARCH=arm menuconfig
```

- Select Device Drivers from the main menu.

```
...
...
Kernel Features  --->
Boot options  --->
CPU Power Management  --->
Floating point emulation  --->
Userspace binary formats  --->
Power management options  --->
[*] Networking support  --->
Device Drivers  --->
...
...
```

Building into Kernel

- Select MMC/SD/SDIO card support from the menu.

```
...
...
[*] USB support  --->
<*> MMC/SD/SDIO card support  --->
< > Sony MemoryStick card support (EXPERIMENTAL)  --->
...
```

```
...
```

- Select OMAP HS MMC driver

```
[ ]   MMC debugging
 [*]   Assume MMC/SD cards are non-removable (DANGEROUS)
 [ ]   MMC host clock gating (EXPERIMENTAL)
       *** MMC/SD/SDIO Card Drivers ***
 <*> MMC block device driver
 (8)     Number of minors per block device
 [*]     Use bounce buffer for simple hosts
 <*>   SDIO UART/GPS class support
 < >   MMC host test driver
 ...
 < >   TI OMAP Multimedia Card Interface support
 <*>   TI OMAP High Speed Multimedia Card Interface support
 ...
```

Building as Loadable Kernel Module

- To build the above components as modules, press 'M' key on every config entries shown below to build them as module:

```
<M> MMC/SD/SDIO card support  --->
<M> MMC block device driver
<M> TI OMAP High Speed Multimedia Card Interface support
```

- After doing module selection, exit and save the kernel configuration when prompted.
- Now build the kernel and modules form Linux build host as

```
$ make CROSS_COMPILE=arm-arago-linux-gnueabi- ARCH=arm uImage
$ make CROSS_COMPILE=arm-arago-linux-gnueabi- ARCH=arm modules
```

- Following modules will be built

```
mmc_core.ko
mmc_block.ko
omap_hsmmc.ko
```

- Boot the newly built kernel and transfer the above mentioned .ko files to the filesystem
- Navigate to the directory containing these modules and insert them form type the following commands in console to insert the modules in specified order:

```
# insmod mmc_core.ko
# insmod mmc_block.ko
# insmod omap_hsmmc.ko
```

- If 'udev' is running and the SD card is already inserted, the devices nodes will be created and filesystem will be automatically mounted if exists on the card. Block device nodes(such as /dev/mmcblockp1, /dev/mmcblockp2) are created for user space access.

References

[1] http://www.mmca.org/home

[2] http://www.sdcard.org/home

Article Sources and Contributors

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