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## MMC overview



A quality version of this page, approved on 15 April 2020, was based off this revision.

The MMC (MultiMediaCard) / SD (secure digital) / SDIO (secure digital input/output) subsystem implements a standard Linux<sup>®</sup> host driver to interface with MMC / SD memory cards or SDIO cards.

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## 1 Framework purpose

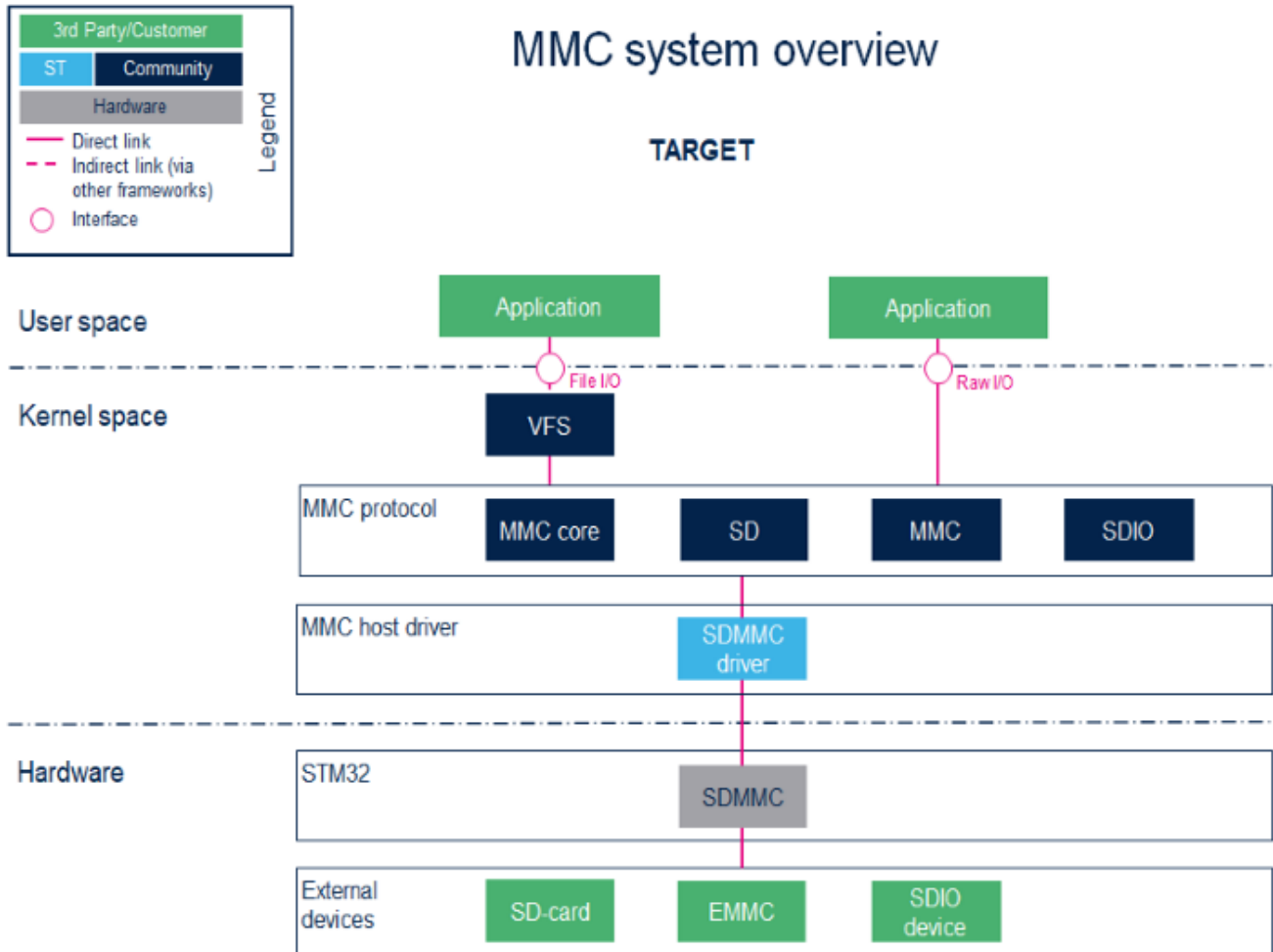
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The purpose of this article is to introduce the MMC Linux<sup>®</sup> subsystem (MMC / SD) by:

- providing general information
- describing the main components/stakeholders

The SDIO is addressed in the [WLAN overview](#).

## 2 System overview



### 2.1 Component description

- User space applications handle **file I/O** management to view the card memory as a disk, whereas programs that perform **raw I/O** accesses see the memory as a block device<sup>[1]</sup>.
- **VFS** (Kernel space)

Virtual File System. Please refer to the VFS documentation<sup>[2]</sup>.

- **MMC core/SD/MMC/SDIO** (Kernel space)

The **MMC core** ensures compliance with MultiMediaCard (**MMC**)<sup>[3]</sup> / secure digital (**SD**)<sup>[4]</sup> / secure digital input/output (**SDIO**)<sup>[5]</sup>.

- **SDMMC driver** (Kernel space) / **SDMMC** (hardware)

The **SDMMC driver** handles:

- the registers, the clock, the interrupt and the IDMA control.
- the communications over the bus based on command/response and data transfers.

Please refer to the SDMMC internal peripheral.



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## 2.2 API description

The MMC core handles the file system read/write calls.



## 3 Configuration

### 3.1 Kernel configuration

The MMC framework is activated by default in ST deliveries. If a specific configuration is needed, this section indicates how the MMC framework can be activated/inactivated in the kernel.

The MMC framework can be activated in the kernel configuration via Linux<sup>®</sup> Menuconfig tool: [Menuconfig](#) or [how to configure kernel](#)

```
[*] Device Drivers
  [*] MMC/SD/SDIO card support
    <*> HW reset support for eMMC
    <*> Simple HW reset support for MMC
    <*> MMC block device driver
        (16) Number of minors per block device
    . . .
    <*> ARM AMBA Multimedia Card Interface support
  [*] STMicroelectronics STM32 SDMMC Controller
```

### 3.2 Device tree configuration

DT configuration can be done thanks to [STM32CubeMX](#).

Please refer to the [SDMMC device tree configuration](#).



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## 4 How to use the framework

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A file system, which handles read/write/erase operations, can be used with the MMC framework. Please refer to the [EXT4 support through MMC](#).



## 5 How to trace and debug the framework

### 5.1 How to monitor

The sysfs interface provides detailed information on each mmc device:

```
root:~# cat /sys/kernel/debug/mmc0/ios
clock:          50000000 Hz
vdd:            21 (3.3 ~ 3.4 V)
bus mode:       2 (push-pull)
chip select:    0 (don't care)
power mode:     2 (on)
bus width:      2 (4 bits)
timing spec:    2 (sd high-speed)
signal voltage: 0 (3.30 V)
driver type:    0 (driver type B)
```

### 5.2 How to trace

For details on dynamic trace usage, refer to [How to use the kernel dynamic debug](#).

```
root:~# echo "file drivers/mmc/* +p" > /sys/kernel/debug/dynamic_debug/control
```





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## 6 Source code location

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The MMC framework is available [here](#) .



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## 7 References

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Please refer to the following links for a full description of the MMC framework:

- [https://en.wikipedia.org/wiki/Device\\_file#Block\\_devices](https://en.wikipedia.org/wiki/Device_file#Block_devices)
- VFS
- MultiMediaCard, embedded MultiMediaCard specification
- Secure Digital, secure digital specification
- Secure Digital Input Output, Secure Digital Input Output specification

MultimediaCard

Linux<sup>®</sup> is a registered trademark of Linus Torvalds.

Secure digital

Virtual File System

Secure digital input/output

Application programming interface

SDIO is an SD-size card with extended input/output functions

former spelling for e•MMC ('e' in italic)

Device Tree

System File System (See <https://en.wikipedia.org/wiki/Sysfs> for more details)