



SAI Linux driver



Contents

1. SAI Linux driver	3
2. SAI internal peripheral	5
3. ALSA overview	5
4. Menuconfig or how to configure kernel	5
5. SAI device tree configuration	5
6. Debugfs	6
7. Clock overview	6
8. Pinctrl overview	6



SAI Linux driver

Stable: 22.10.2019 - 08:02 / Revision: 22.10.2019 - 08:01

Contents

1 Article purpose	3
2 Short Description	3
3 Configuration	3
3.1 Kernel Configuration	3
3.2 Device tree	4
4 How to use	4
5 How to trace and debug	4
6 Source code location	4
7 References	5

1 Article purpose

This article introduces the SAI Linux[®] driver for the SAI internal peripheral.

2 Short Description

The SAI^[1] Linux driver is an ASoC CPU DAI driver implemented in the Linux ALSA framework.

3 Configuration

3.1 Kernel Configuration

Activate the SAI^[1] Linux driver in the kernel configuration using the Linux Menuconfig tool: Menuconfig or how to configure kernel.

```
[*] Device Drivers
    [*] Sound card support
        [*] Advanced Linux Sound Architecture
            [*] ALSA for SoC audio support
                STMicroelectronics STM32 SOC audio support
                    [*] STM32 SAI interface (Serial Audio Interface) support
```



3.2 Device tree

Refer to the [SAI device tree configuration](#) article when configuring the SAI Linux kernel driver.

4 How to use

The SAI Linux driver can be accessed from userland through an ALSA device. Refer to [ALSA overview](#) for information on how to list and use ALSA devices.

5 How to trace and debug

The `debugfs` and `procfs` file system can be checked to get information on the SAI driver and the resources it uses. A non-exhaustive list of these file system entries is provided below. Refer to [ALSA overview](#) for more details on debugging tools.

- `debugfs` entries:
 - **asoc**: refer to [ALSA_overview#How_to_monitor](#)
 - **clk**: refer to [Clock_overview#How_to_monitor_with_debugfs](#) to get information on clocks.
 - **pinctrl**: refer to [Pinctrl_overview#How_to_monitor](#) to get information on pins.
 - **regmap**: allow to monitor SAI peripheral registers.

```
$ cat /sys/kernel/debug/regmap/xxx.audio-controller/registers
```

- `procfs` entries:
 - **asound**: refer to [ALSA_overview#How_to_debug](#)
 - **interrupts**: allow to check interrupts.

```
$ cat /proc/interrupts
```

6 Source code location

The STM32 SAI peripheral includes two independent audio subblocks that share common resources. The driver source code reflects this architecture.

`sound/soc/stm/stm32_sai.c` : handles common resources such as clock, interrupt, reset and shared register.

`sound/soc/stm/stm32_sai_sub.c` : handles the resources dedicated to each subblock.



7 References

- 1.01.1 SAI internal peripheral

Serial Audio Interface (Mechanism used to transfer non-buffered audio data between processors and/or audio converters.)

ALSA System on Chip

Central processing unit

Digital Audio Interface

Advanced Linux sound architecture

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

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

Permission error

Stable: 21.01.2020 - 13:23 / Revision: 21.01.2020 - 13:21

You do not have permission to read this page, for the following reason:

The action "Read pages" for the draft version of this page is only available for the groups ST_editors, ST_readers, Selected_editors, sysop, reviewer

Permission error

Stable: 15.04.2020 - 08:02 / Revision: 15.04.2020 - 08:00

You do not have permission to read this page, for the following reason:

The action "Read pages" for the draft version of this page is only available for the groups ST_editors, ST_readers, Selected_editors, sysop, reviewer

Permission error

Stable: 22.04.2020 - 13:12 / Revision: 22.04.2020 - 13:10

You do not have permission to read this page, for the following reason:

The action "Read pages" for the draft version of this page is only available for the groups ST_editors, ST_readers, Selected_editors, sysop, reviewer

Permission error

Stable: 02.06.2020 - 14:34 / Revision: 28.05.2020 - 07:08



You do not have permission to read this page, for the following reason:

The action "Read pages" for the draft version of this page is only available for the groups ST_editors, ST_readers, Selected_editors, sysop, reviewer

Permission error

Stable: 04.02.2020 - 07:47 / Revision: 04.02.2020 - 07:34

You do not have permission to read this page, for the following reason:

The action "Read pages" for the draft version of this page is only available for the groups ST_editors, ST_readers, Selected_editors, sysop, reviewer

Permission error

Stable: 15.10.2019 - 11:58 / Revision: 15.10.2019 - 11:57

You do not have permission to read this page, for the following reason:

The action "Read pages" for the draft version of this page is only available for the groups ST_editors, ST_readers, Selected_editors, sysop, reviewer

Permission error

Stable: 11.06.2020 - 09:03 / Revision: 10.06.2020 - 15:17

You do not have permission to read this page, for the following reason:

The action "Read pages" for the draft version of this page is only available for the groups ST_editors, ST_readers, Selected_editors, sysop, reviewer