Jetson Camera Documentation

Wednesday, March 6, 2019 12:11 PM

To read imx219 on i2c bus:

1. Connect camera to CSI port

2. Power on camera through GPIO pin 457 (CAM1-rst) ((Forums and manuals ask to turn on 461(CAM0-rst) but for some reason, it doesn't work))
   a. sudo -I
   b. echo 457 > /sys/class/gpio/export
   c. echo out > /sys/class/gpio/gpio457/direction
   d. echo 0 > /sys/class/gpio/gpio457/value
   e. echo 1 > /sys/class/gpio/gpio457/value

3. To ensure step 1 is successful,
   a. sudo i2cdetect –y –r 1 (if connected to CSI-CD of J90)
   b. sudo i2cdetect –y –r 7 (if connected to CSI-EF of J90)
   c. Output will look something like below. The **10** is the address of the camera.

```
     0  1  2  3  4  5  6  7  8  9  a  b  c  d  e  f
00:          -- -- -- -- -- -- -- -- -- -- -- -- --
10: 10 -- -- -- -- -- -- -- -- -- -- -- -- -- --
20: -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
30: -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
40: -- -- -- -- -- -- -- -- -- -- -- UU -- -- --
50: 50 -- -- -- -- -- -- -- -- -- -- -- -- -- --
60: -- -- -- -- 64 -- -- -- -- -- -- -- -- -- --
70: -- -- -- -- -- -- -- --
```

Kernel source file changes:

The below is for a single camera set-up, connected to 2 lanes of the CSI-EF ports of the J90 board.
The following changes should be made to the kernel source files between step 8, and step 9, in the Building Kernel TX2 document:

1. Open 64_TX2/Linux_for_Tegra_tx2/sources/hardware/nvidia/platform/t18x/quill/kernel-dts/tegra186-quill-p3310-1000-a00-00-base.dts

2. In the include commands, comment out the following commands:
   a. *#include <t18x-common-platforms/tegra186-quill-camera-modules.dtsi> should become //#include <t18x-common-platforms/tegra186-quill-camera-modules.dtsi>*

   b. *#include <t18x-common-plugin-manager/tegra186-quill-camera-plugin-manager.dtsi> should become //#include <t18x-common-plugin-manager/tegra186-quill-camera-plugin-manager.dtsi>*

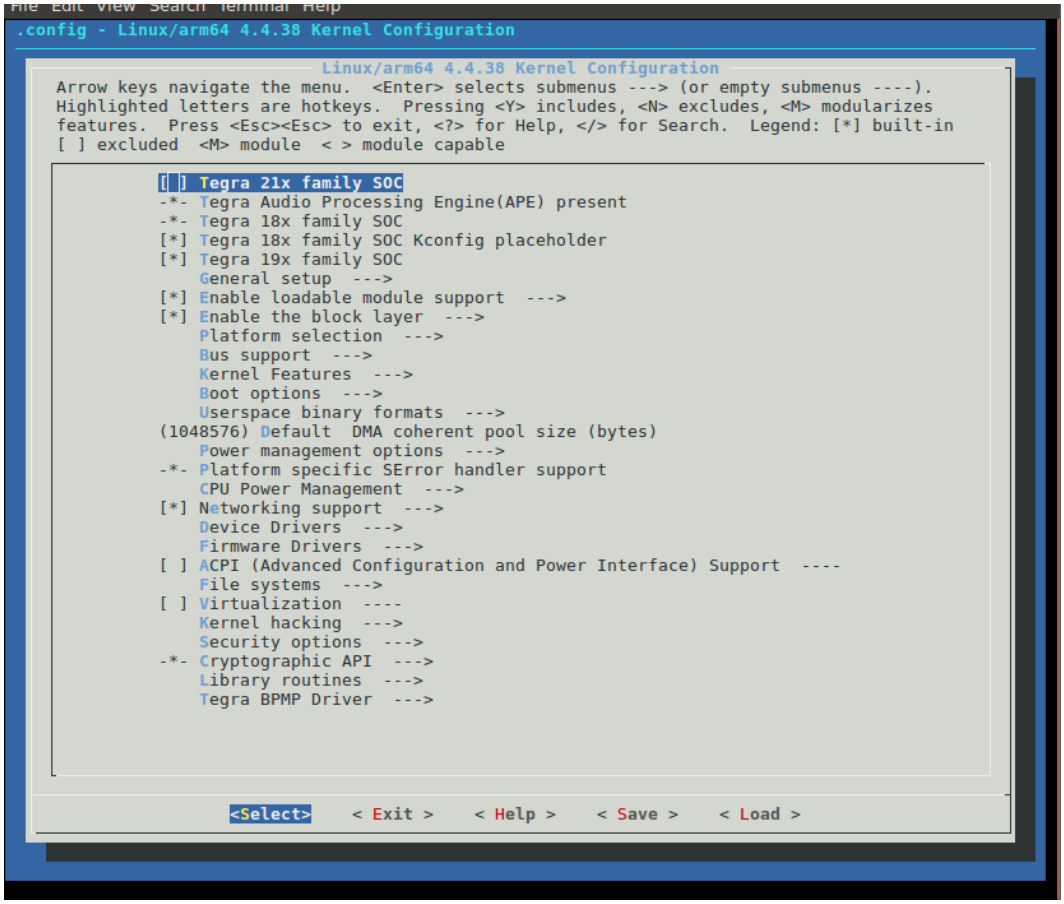
3. Rename tegra186-my-camera-config-a00_modules.dtsi to tegra186-my-camera-config-a00.dtsi, and copy it to 64_TX2/Linux_for_Tegra_tx2/sources/hardware/nvidia/platform/t18x/common/kernel-dts/t18x-common-modules/

4. Rename tegra186-my-camera-config-a00_platforms.dtsi to tegra186-my-camera-config-a00.dtsi, and copy it to 64_TX2/Linux_for_Tegra_tx2/sources/hardware/nvidia/platform/t18x/common/kernel-dts/t18x-common-platforms/

5. Open 64_TX2/Linux_for_Tegra_tx2/sources/hardware/nvidia/platform/t18x/quill/kernel-dts/tegra186-quill-p3310-1000-c03-00-base.dts
   a. Add **#include <t18x-common-platforms/tegra186-my-camera-config-a00.dtsi>**

6. Copy the modified imx219 driver file and mode tables file, 'imx219.c' and 'imx219_mode_tbls.h' to the folder: /64_TX2/Linux_for_Tegra_tx2/sources/kernel/kernel-4.4/drivers/media/i2c , replacing the original files

7. While running step 9.e (compile script) step, you will get a menuconfig UI, which looks like this:



a. Press '/' button, and search 'IMX219'
b. Press '1.' And then spacebar
c. Press 'spacebar' until the module until the selection is a '*'
d. Exit and save

This is necessary for enabling the IMX219 driver.

Primary References:

1. http://cospandesign.github.io/linux,tx2,kernel,driver/2017/12/15/tx2-rpi-camera-port.html
2. Jetson tx2 forums: https://devtalk.nvidia.com/member/3064655/
   a. Check my posts and activity. (user rm95)
3. J90 technical_reference.pdf
4. Jetson_TX2_Series_Modules_DataSheet_v1.2.pdf