Adding Vision Components MIPI CSI-2 driver for NVIDIA

Readme made by Deepak Kumar Beniya
Embedded Software Developer
deepakbeniya64@gmail.com
LinkedIN
Instagram

1. Kernel Source PWD

tegra-demo-distro/build_tegra_demo/tmp/work-shared/jetson-orin-nano-devkit/kernel-source

2. DeviceTree Path

tegra-demo-distro/build_tegra_demo/tmp/work-shared/jetson-orin-nano-devkit/kernel-source/nvidia/platform/t23x/p3768/kernel-dts

3. DeviceTree Source

tegra234-p3767-0000-p3768-0000-a0.dts

Now Follow the steps to add the driver..

1. First run the toolchain

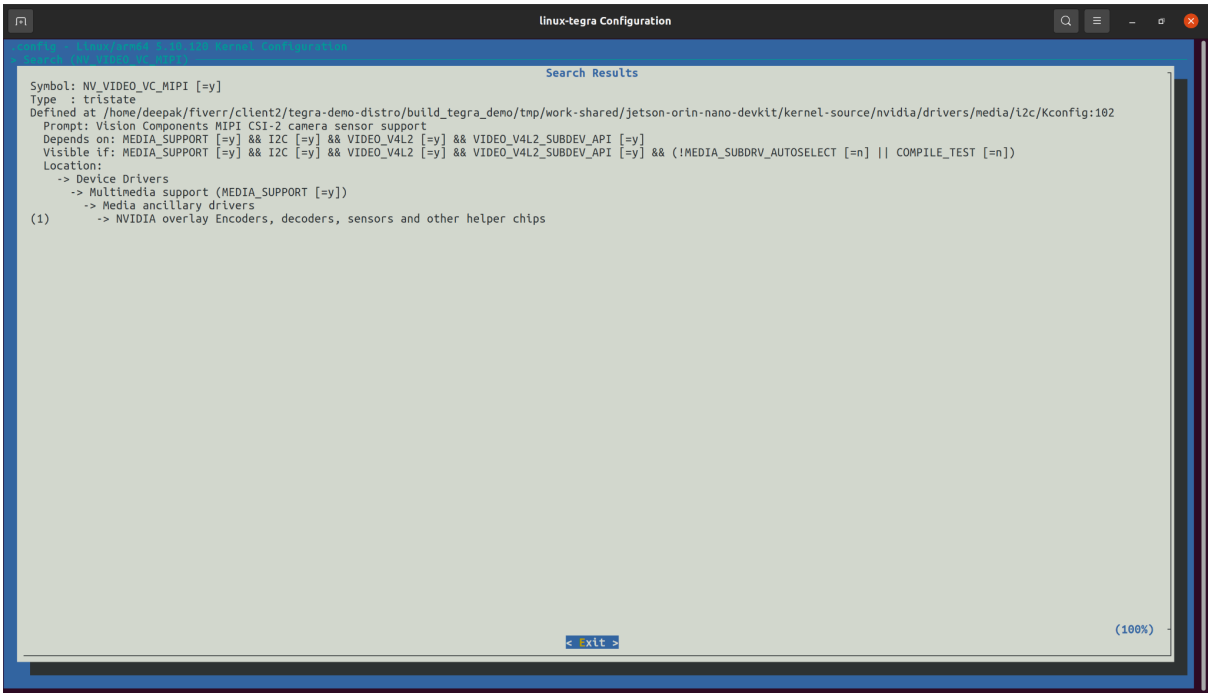
   -> . setup-env build_tegra_demo
2. Apply The two patches in the kernel source path I have mentioned above .

   -> git am 0001-kernel_common_32.3.1-Four-Patches-are-added-into-sin.patch

   -> git am 0002-Driver-for-Vision-Components-added.patch
3. Now Open menuconfig to add the driver

   -> bitbake linux-tegra -c menuconfig

   -> enter / and paste NV_VIDEO_VC_MIPI
4. You will be able to see like this



5. Path for that driver

   Location:

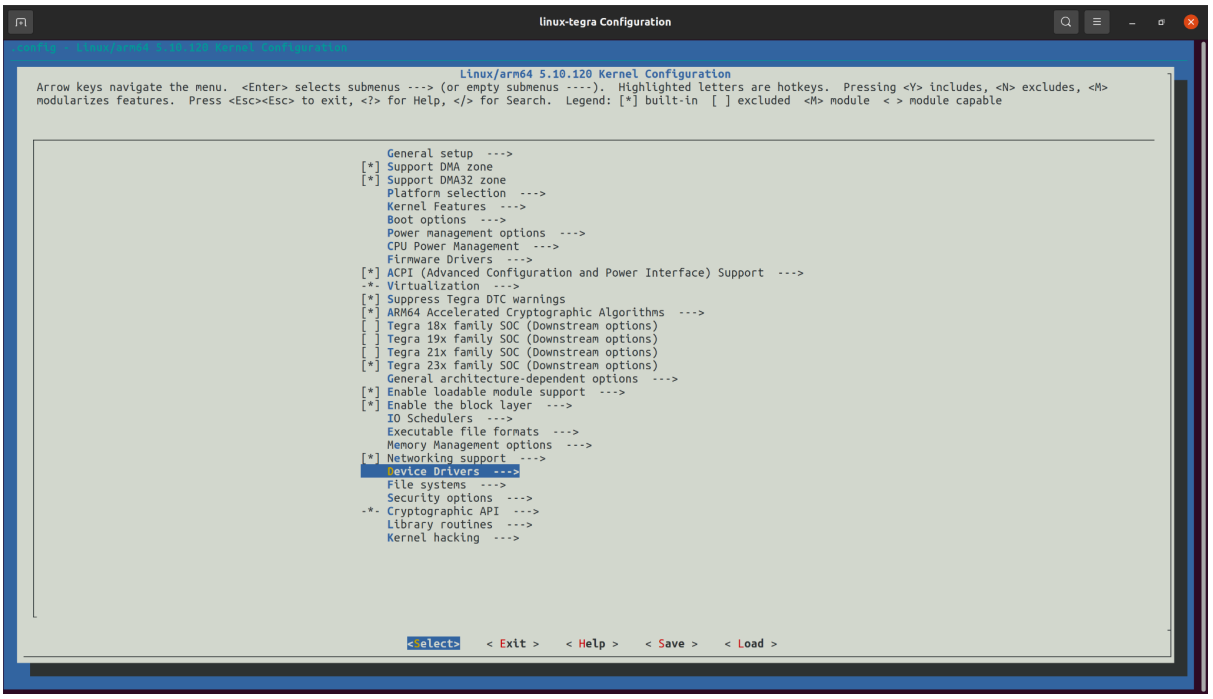
   │ -> Device Drivers

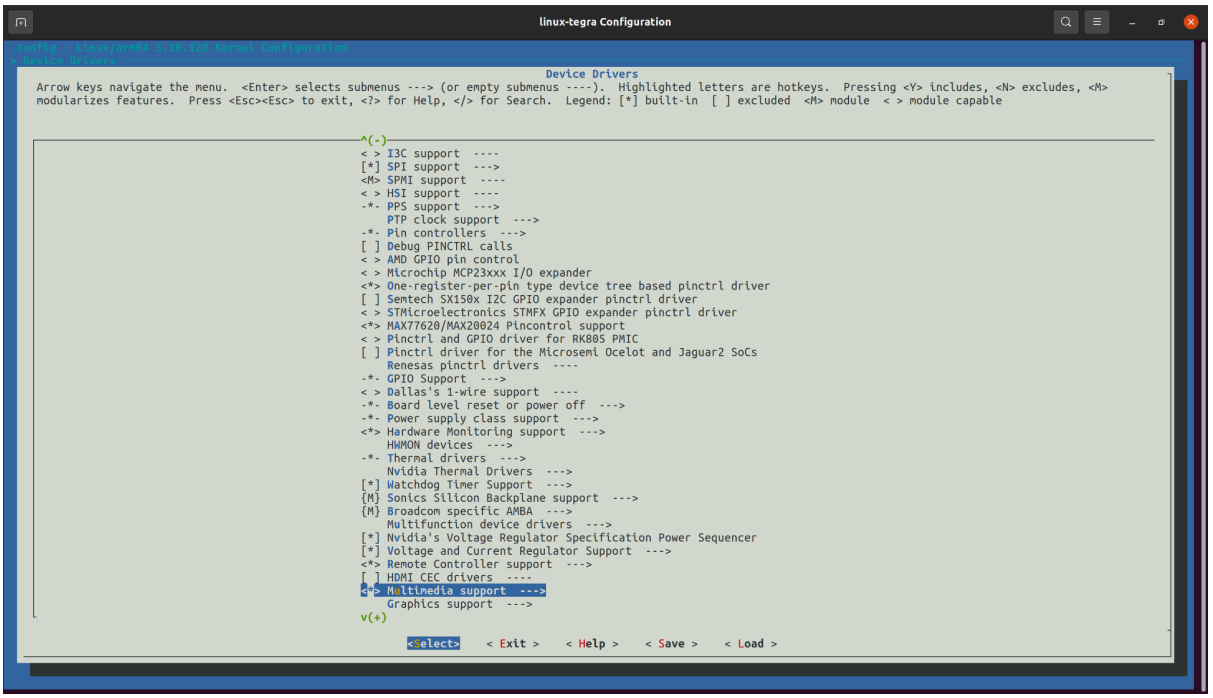
   │ -> Multimedia support (MEDIA_SUPPORT [=y])

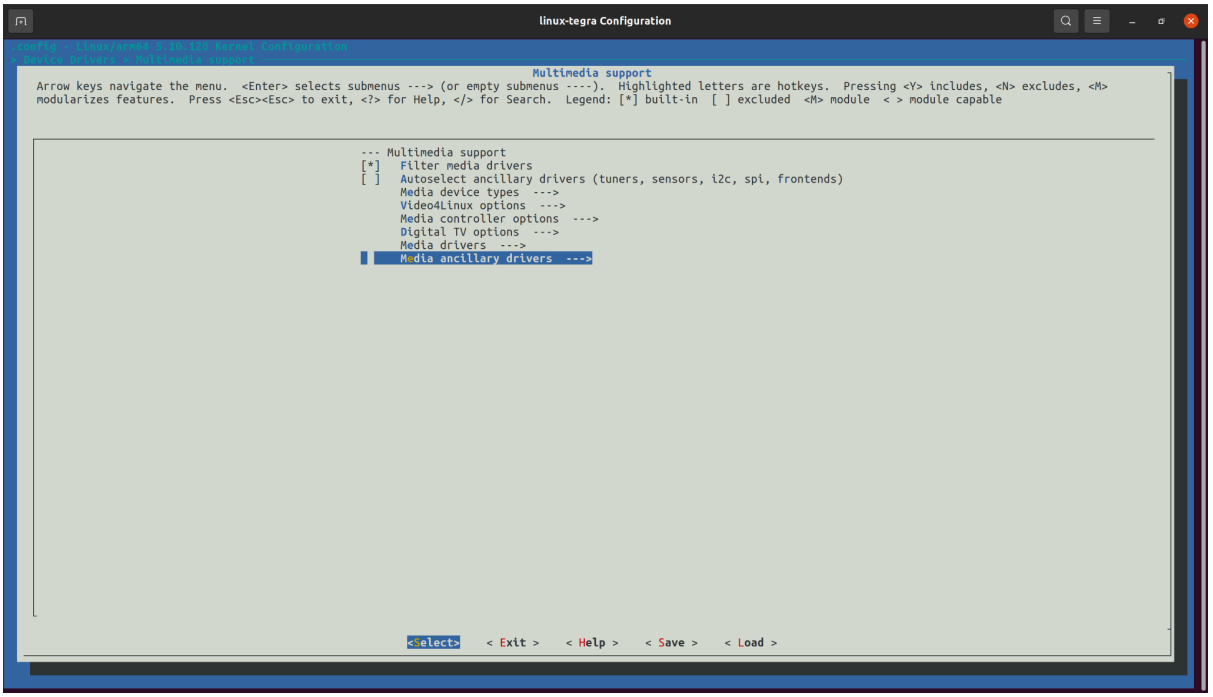
   │ -> Media ancillary drivers

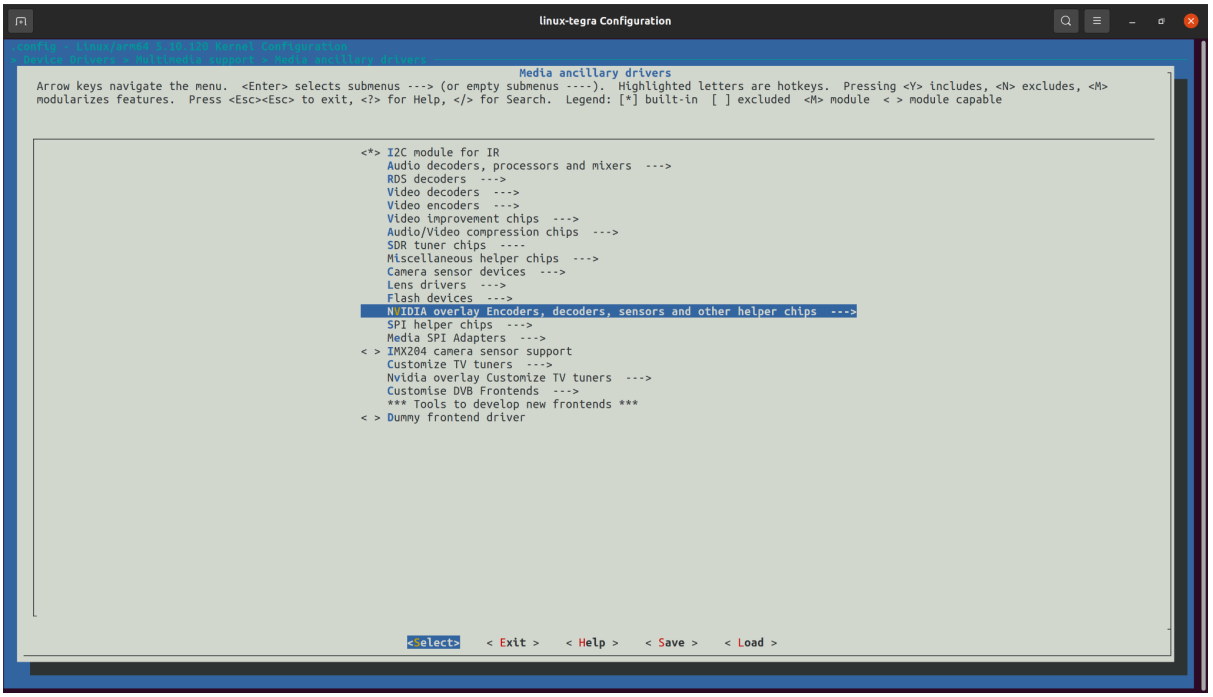
   │ -> NVIDIA overlay Encoders, decoders, sensors and

6.

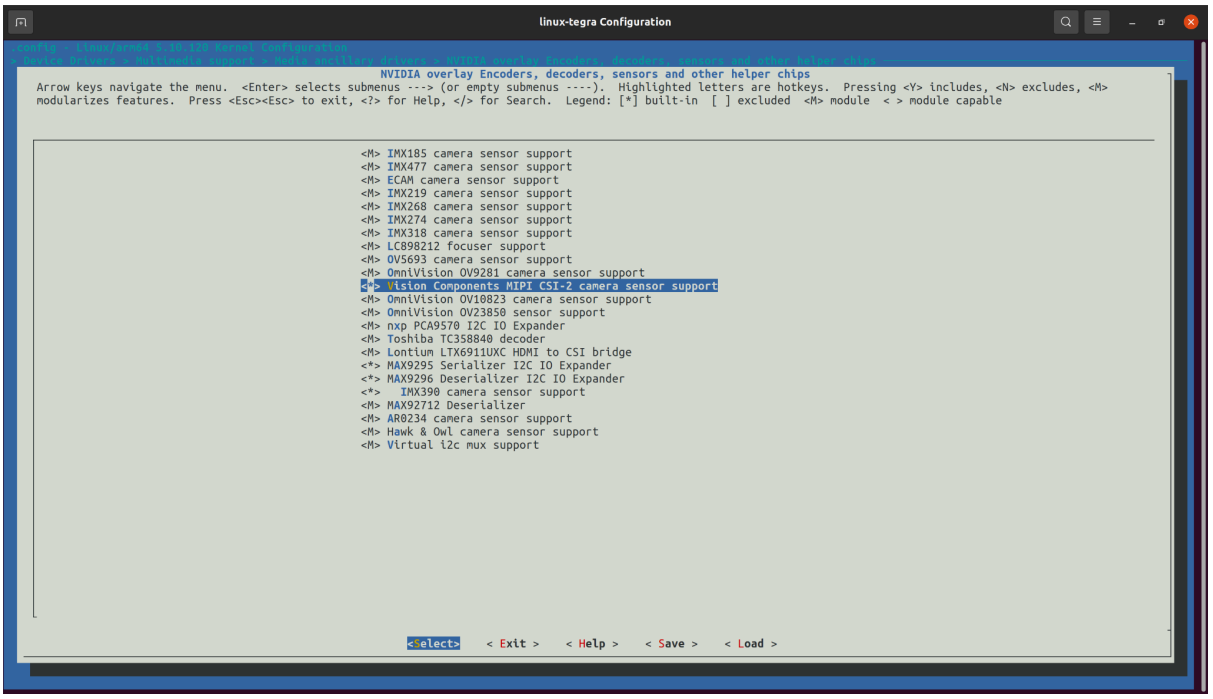

linux-tegra Configuration
.config - Linux/arm64 5.10.120 Kernel Configuration
Linux/arm64 5.10.120 Kernel Configuration
Arrow keys navigate the menu. <Enter> selects submenus ---> (or empty submenus ----). Highlighted letters are hotkeys. Pressing <Y> includes, <N> excludes, <M> modularizes features. Press <Esc><Esc> to exit, <?> for Help, </> for Search. Legend: [*] built-in [ ] excluded <M> module < > module capable
General setup --->
[*] Support DMA zone
[*] Support DMA32 zone
Platform selection --->
Kernel Features --->
Boot options --->
Power management options --->
CPU Power Management --->
Firmware Drivers --->
[*] ACPI (Advanced Configuration and Power Interface) Support --->
-*- Virtualization --->
[*] Suppress Tegra DTC warnings
[*] ARM64 Accelerated Cryptographic Algorithms --->
[ ] Tegra 18x family SOC (Downstream options)
[ ] Tegra 19x family SOC (Downstream options)
[ ] Tegra 21x family SOC (Downstream options)
[*] Tegra 23x family SOC (Downstream options)
General architecture-dependent options --->
[*] Enable loadable module support --->
[*] Enable the block layer --->
IO Schedulers --->
Executable file formats --->
Memory Management options --->
[*] Networking support --->
Device Drivers --->
File systems --->
Security options --->
-*- Cryptographic API --->
Library routines --->
Kernel hacking --->
<Select> < Exit > < Help > < Save > < Load >


linux-tegra Configuration
.config - Linux/arm64 5.10.120 Kernel Configuration
Device Drivers
Arrow keys navigate the menu. <Enter> selects submenus ---> (or empty submenus ----). Highlighted letters are hotkeys. Pressing <Y> includes, <N> excludes, <M> modularizes features. Press <Esc><Esc> to exit, <?> for Help, </> for Search. Legend: [*] built-in [ ] excluded <M> module < > module capable
^(-)
< > I3C support ----
[*] SPI support --->
<M> SPMI support ----
< > HSI support ----
-*- PPS support --->
PTP clock support --->
-*- Pin controllers --->
[ ] Debug PINCTRL calls
< > AMD GPIO pin control
< > Microchip MCP23xxx I/O expander
<*> One-register-per-pin type device tree based pinctrl driver
[ ] Semtech SX150x I2C GPIO expander pinctrl driver
< > STMicroelectronics STMFX GPIO expander pinctrl driver
<*> MAX77620/MAX20024 Pincontrol support
< > Pinctrl and GPIO driver for RK805 PMIC
[ ] Pinctrl driver for the Microsemi Ocelot and Jaguar2 SoCs
Renesas pinctrl drivers ----
-*- GPIO Support --->
< > Dallas's 1-wire support ----
-*- Board level reset or power off --->
-*- Power supply class support --->
<*> Hardware Monitoring support --->
HWMON devices --->
-*- Thermal drivers --->
Nvidia Thermal Drivers --->
[*] Watchdog Timer Support --->
{M} Sonics Silicon Backplane support --->
{M} Broadcom specific AMBA --->
Multifunction device drivers --->
[*] Nvidia's Voltage Regulator Specification Power Sequencer
[*] Voltage and Current Regulator Support --->
<*> Remote Controller support --->
[ ] HDMI CEC drivers ----
<*> Multimedia support --->
Graphics support --->
v(+)
<Select> < Exit > < Help > < Save > < Load >


linux-tegra Configuration
.config - Linux/arm64 5.10.120 Kernel Configuration
> Device Drivers > Multimedia support
Multimedia support
Arrow keys navigate the menu. <Enter> selects submenus ---> (or empty submenus ----). Highlighted letters are hotkeys. Pressing <Y> includes, <N> excludes, <M> modularizes features. Press <Esc><Esc> to exit, <?> for Help, </> for Search. Legend: [*] built-in [ ] excluded <M> module < > module capable
--- Multimedia support
[*] Filter media drivers
[ ] Autoselect ancillary drivers (tuners, sensors, i2c, spi, frontends)
Media device types --->
Video4Linux options --->
Media controller options --->
Digital TV options --->
Media drivers --->
Media ancillary drivers --->
<Select>
< Exit >
< Help >
< Save >
< Load >


linux-tegra Configuration
.config - Linux/arm64 5.10.120 Kernel Configuration
> Device Drivers > Multimedia support > Media ancillary drivers
Media ancillary drivers
Arrow keys navigate the menu. <Enter> selects submenus ---> (or empty submenus ----). Highlighted letters are hotkeys. Pressing <Y> includes, <N> excludes, <M> modularizes features. Press <Esc><Esc> to exit, <?> for Help, </> for Search. Legend: [*] built-in [ ] excluded <M> module < > module capable
<*> I2C module for IR
Audio decoders, processors and mixers --->
RDS decoders --->
Video decoders --->
Video encoders --->
Video improvement chips --->
Audio/Video compression chips --->
SDR tuner chips ----
Miscellaneous helper chips --->
Camera sensor devices --->
Lens drivers --->
Flash devices --->
NVIDIA overlay Encoders, decoders, sensors and other helper chips --->
SPI helper chips --->
Media SPI Adapters --->
< > IMX204 camera sensor support
Customize TV tuners --->
Nvidia overlay Customize TV tuners --->
Customise DVB Frontends --->
*** Tools to develop new frontends ***
< > Dummy frontend driver
<Select>
< Exit >
< Help >
< Save >
< Load >

7. Press the <Spacebar> to enable as static



8. Exit and Save the Configuration
9. Compile the Yocto Source
   -> *bitbake demo-image-base*
10 . You Can get the images from here

->tegra-demo-distro/build_tegra_demo/tmp/deploy/images/jetson-orin-nano-devkit