

BOARD SUPPORT PACKAGE

For Connect Tech NVIDIA Jetson TX2-NX Carriers

BSP Version: TX2-NX-32.7.1 V003
Last Updated: 2022/04/27

Introduction

This Board Support Package adds support for Connect Tech Jetson TX2-NX Family of carrier boards to Linux4Tegra. It includes any extra files required to use all the features of the carriers.

Please check the "Product Specific Details" section for what features for your board is supported with this BSP release and the "Changes" section for the changes made between versions. You can check which version of the BSP you have installed by running:

```
cat /etc/cti/CTI-L4T.version
```

Check for the Latest Version of the CTI-L4T BSP at:
<https://connecttech.com/resource-center/l4t-board-support-packages/>

More detailed Release Note can be found here:
<http://connecttech.com/resource-center/cti-l4t-nvidia-jetson-board-support-package-release-notes/>

Requirements

- x86 based host machine running Ubuntu 18.04
- JetPack 4.6.1 installed via NVIDIA SDK Manager (from NVIDIA Embedded Download Center)
- TX2-NX module
- Connect Tech TX2-NX Family Carrier
- USB Cable for flashing

*L4T version can be found in `/etc/nv_tegra_release` and will look like this:
R32 (release), REVISION: 7.1

Supported Cameras in BSP

- Raspberry Pi v2 Camera module (MIPI with IMX219 sensor)

- ArduCAM (MIPI with IMX477 sensor)
- ECON e-CAM30 (MIPI with AR0330 sensor)
- ECON e-CAM80 (MIPI with IMX415 sensor)
- Famos Camera module (MIPI with IMX415 sensor)
- Famos Camera module (MIPI with IMX464 sensor)
- Famos Camera module (MIPI with IMX290 sensor)
- Famos Camera module (MIPI with IMX327 sensor)
- Famos Camera module (MIPI with IMX412 sensor)
- Famos Camera module (MIPI with IMX462 sensor)
- Famos Camera module (MIPI with IMX477 sensor)
- Famos Camera module (MIPI with IMX577 sensor)
- Famos Camera module (MIPI with IMX296 sensor)
- Famos Camera module (MIPI with IMX297 sensor)
- Famos Camera module (MIPI with IMX334 sensor)
- Famos Camera module (MIPI with IMX335 sensor)
- Famos Camera module (MIPI with IMX565 sensor)

Installation (Preferred approach)

- Before Installing the BSP you will need to install Jetpack 4.6.1 on the x86 host system using the NVIDIA SDK Manager or from the source packages on NVIDIA's website as detailed below.
- Copy the CTI-L4T-TX2-NX-32.7.1-V###.tgz package into
`~/nvidia/nvidia_sdk/JetPack_4.6.1_Linux_JETSON_TX2_NX_DEVKIT/Linux_for_Tegra/`
- Extract the BSP:
`tar -xzf CTI-L4T-TX2-NX-32.7.1-V###.tgz`
- Change into the CTI-L4T directory:
`cd ./CTI-L4T`
- Run the install script (as root or sudo) to automatically install the BSP files to the correct locations:

`sudo ./install.sh`
`cd ..`
- The CTI-L4T BSP is now installed on the host system and it should now be able to flash the TX2-NX.
- To flash on the TX2-NX use the following (do not add ".conf"):

CTI Assisted Flashing:
`./cti-flash.sh`

Manual Flash:
./flash.sh cti/tx2-nx/<board>/<config> mmcblk0p1
./flash.sh cti/tx2-nx/photon/base mmcblk0p1

Installing JetPack from NVIDIA's Source packages (Alternate approach)

- Go to <https://developer.nvidia.com/embedded/linux-tegra-archive> and click on the green button labeled "32.7.1 >"
- Download the "L4T Driver Package (BSP)" and "Sample Root Filesystem" files for TX2 NX. Alternatively, you can use the files "Jetson_Linux_R32.7.1_aarch64.tbz2" and "Tegra_Linux_Sample-Root-Filesystem_R32.7.1_aarch64.tbz2" from your SDKManager downloads folder (This would be the folder you selected as the "Download folder" in step 2 "Details and License" of SDKManager).
- Create a directory named `~/nvidia/nvidia_sdk/JetPack_4.6.1_Linux_JETSON_TX2_NX_DEVKIT/` and copy the "Jetson_Linux_R32.7.1_aarch64.tbz2" file you downloaded into that directory.
- Unzip the tarball with
`"sudo tar jxf Jetson_Linux_R32.7.1_aarch64.tbz2"`.

You should now have a new directory called `Linux_for_Tegra` in your folder. Change directories into that and then copy the "Tegra_Linux_Sample-Root-Filesystem_R32.7.1_aarch64.tbz2" file you downloaded into the `rootfs` folder.

- Change into the `rootfs` folder and unzip the tarball with
`"sudo tar jxf Tegra_Linux_Sample-Root-Filesystem_R32.7.1_aarch64.tbz2"`
- You can change directories back to
`~/nvidia/nvidia_sdk/JetPack_4.6.1_Linux_JETSON_TX2_NX_DEVKIT/Linux_for_Tegra/`
and run:
`"sudo ./apply_binaries.sh"`

if you wish to flash one of NVIDIA's devkits, or move on to installing CTI's BSP with the instructions above.

Flashing TX2-NX

- Connect the TX2-NX and Carrier to the computer via USB following the instructions in the appropriate manual
- Put the system to be flashed into recovery mode, following the instructions in the appropriate manual

- Run `./cti-flash.sh` or `./flash.sh cti/tx2-nx/<board> mmcblk0p1` from `Linux_for_Tegra` directory
- Once the flashing has completed, the TX2-NX will reboot
- To switch between different boards, you can repeat these steps. Alternatively follow the instructions below for runtime switching profiles on the TX2-NX

Switching Profiles on TX2-NX

- Open a terminal on the TX2-NX
- Run `sudo cti-tx2-nx-fdt.sh`
- Select the profile you wish to switch to from the menu
- Restart the system

Product Specific Details

NGX003 (Photon)

- USB 2.0 and 3.0 Support
- USB OTG Support
- MIPI Camera Support
- HDMI Support
- Micro SD Card Support
- NVMe Card Support
- PoE Support
- Wifi/Bluetooth Card Support
- Cellular Card Support
- RGB LED Support
- UART Support
- I2C Support
- GPIO Support
- PWM Fan Support

NGX004 (Quark)

- USB 2.0 and 3.0 Support
- USB OTG Support
- MIPI Camera Support

- Micro SD Card
- GbE Phy Support
- CAN Support
- UART Support
- I2C Support
- GPIO Support
- SPI Support
- PWM Support
- PWM Fan Support

NGX006 (Rudi-NX)

- USB 2.0 and 3.0 Support
- USB OTG Support
- HDMI Support
- SD Card Support
- NVMe Card Support
- CAN Support
- GbE Phy Support
- Cellular Card Support
- Wifi/Bluetooth card Support
- UART Support
- RS485 Support
- I2C Support
- GPIO Support
- SPI Support
- PWM Support

NGX007 (Boson)

- USB 2.0 and 3.0 Support
- USB OTG Support
- FRAMOS Camera Support
- Display(HDMI)
- Wifi/Bluetooth Support
- Micro SD Card Support
- NVMe Card Support
- CAN Support
- SPI Support
- PWM Support
- I2C Support
- GPIO Support
- PWM Fan Support
- UART Support

Changes

Version TX2-NX-32.7.1 V003, Apr 27, 2022

- Added support for Arducam IMX477 on Quark
- Added PTN5150 USB Current limit advertisement config support for NGX014 to NGX004 dtb (NGX014 = Quark + PTN5150 USB CC Logic Chip)

Version TX2-NX-32.7.1 V002, Apr 08, 2022

- Added support for Arducam IMX477 on Photon

Version TX2-NX-32.7.1 V001, Mar 21, 2022

- Initial Release for JetPack 4.6.1
- Added support for additional Framos cameras on Boson (IMX464, IMX290, IMX327, IMX412, IMX462, IMX477, IMX577, IMX296, IMX297, IMX334, IMX335, and IMX565)
- Fixed bug with Boson OTG support
- Fixed DTB switch bug that was occurring after OTA update from earlier L4T versions.

Version TX2-NX-32.6.1 V003, Feb 18, 2022

- Added support for e-CAM30 and e-CAM80 on Photon and Quark
- Added support for Rudi-NX carrier

Version TX2-NX-32.6.1 V002, Nov 19, 2021

- Fixed UART1 bug. Port now working on /dev/ttyTHS2 on applicable carriers.

Version TX2-NX-32.6.1 V001, Sep 18, 2021

- Initial release on Jetpack 4.6 L4T 32.6.1
- Support for Photon, Quark and Boson
- Supported camera is IMX219 and IMX415
- Device tree switching and bootloader OTA are supported.

Version TX2-NX-32.5.1 V001, Mar 22, 2021

- Initial Release for the TX2-NX
- Support for Photon, Quark and Boson
- Supported camera is IMX219 and IMX415
- Device tree switching and bootloader OTA are not supported.

Contact Connect Tech

If you have any problems, questions or suggestions regarding the Board Support Package and hardware, please feel free to contact Connect Tech Inc.

Contact Information	
Support	Please go to the Connect Tech Resource Center for product manuals, installation guides, device drivers, BSPs and technical tips.

	<p>Submit your <u>technical support</u> questions to our support engineers. Technical Support representatives are available Monday through Friday, from 8:30 a.m. to 5:00 p.m. Eastern Standard Time.</p>
Contact Information	<p><u>support@connecttech.com</u> <u>sales@connecttech.com</u> <u>www.connecttech.com</u></p> <p>Toll Free: 800-426-8979 (North America only) Telephone: +1-519-836-1291 Facsimile: 519-836-4878 (on-line 24 hours)</p>