

BOARD SUPPORT PACKAGE

For Connect Tech NVIDIA Jetson Nano Carriers

BSP Version: Nano-32.6.1 V004

Last Updated: 2021/12/10

Introduction

This Board Support Package adds support for Connect Tech Jetson Nano 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/>

Requirements

- x86 based host machine running Ubuntu 18.04
- JetPack 4.6 installed via NVIDIA SDK Manager (from NVIDIA Embedded Download Center) or via source packages from NVIDIA's website
- Production Nano module
- Connect Tech Nano Family Carrier
- USB Cable for flashing

*L4T version can be found in `/etc/nv_tegra_release` and will look like this:

R32 (release), REVISION: 6.1

*CTI version can be found in `/etc/cti/CTI-L4T.version` and will look like this:

V001

Supported Cameras in BSP

- ArduCam 12.3MP IMX477 HQ MIPI Camera Module
- E-Con Systems e-CAM30_CUNANO AR0330 MIPI Camera
- E-Con Systems e-CAM50_CUNX AR0521 MIPI Camera
- E-Con Systems e-CAM80_CUNX IMX415 MIPI Camera
- Raspberry Pi Camera Module v2 IMX219 MIPI Camera
- Vision Components VC MIPI IMX327-C Camera
- Vision Components VC MIPI OV9281 Camera
- Vision Components VC MIPI IMX297 Camera
- FRAMOS FSM-IMX415 Color Camera
- FRAMOS FSM-IMX334 Color Camera
- FRAMOS FSM-IMX290 Color Camera
- FRAMOS FSM-IMX327 Color Camera

- FRAMOS FSM-IMX462 Color Camera

Installation

1. Before Installing the BSP you will need to install Jetpack 4.6 on the x86 host system using the NVIDIA SDK Manager or from the source packages on NVIDIA's website as detailed below.
2. Copy the CTI-L4T-NANO-32.6.1-V004.tgz package into
`~/nvidia/nvidia_sdk/JetPack_4.6_Linux_GA_P3448-0020/Linux_for_Tegra/`
3. Extract the BSP:
`tar -xzf CTI-L4T-NANO-32.6.1-V004.tgz`
4. Change into the CTI-L4T directory:
`cd ./CTI-L4T`
5. Run the install script (as root or sudo) to automatically install the BSP files to the correct locations:
`sudo ./install.sh`
`cd ..`
6. The CTI-L4T BSP is now installed on the host system and it should now be able to flash the Nano.
7. To flash on the Nano use the following (do not add ".conf"):
CTI Assisted Flashing: `./cti-flash.sh`
Manual Flash: `./flash.sh cti/nano/photon mmcblk0p1`

Installing JetPack from SDK Manager

Please follow installation steps from kdb374 for Jetpack 4.2+ <https://connecttech.com/resource-center/kdb374/>

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

1. Go to <https://developer.nvidia.com/embedded/linux-tegra-archive> and click on the green button labeled "32.6.1 >".
2. Download the "L4T Driver Package (BSP)" and "Sample Root Filesystem" files for Nano. Afterwards, you should have the files "Jetson-210_Linux_R32.6.1_aarch64.tbz2" and "Tegra_Linux_Sample-Root-Filesystem_R32.6.1_aarch64.tbz2".
3. Create a directory named `~/nvidia/nvidia_sdk/JetPack_4.6_Linux_GA_P3448-0020/` and copy the "Jetson-210_Linux_R32.6.1_aarch64.tbz2" file you downloaded into that directory.
4. Unzip the tarball:
`sudo tar jxf Jetson-210_Linux_R32.6.1_aarch64.tbz2`
5. You should now have a new directory called `Linux_for_Tegra` in your "JetPack_4.6_Linux_GA_P3448-0020" folder. Change directories into that and then copy the

"Tegra_Linux_Sample-Root-Filesystem_R32.6.1_aarch64.tbz2" file you downloaded into the rootfs folder inside.

6. Change into the rootfs folder and unzip the tarball:
"sudo tar jxf Tegra_Linux_Sample-Root-Filesystem_R32.6.1_aarch64.tbz2"
7. If you wish to flash one of NVIDIA's devkits or move onto installing CTI's BSP, you can change directories back to ~/nvidia/nvidia_sdk/JetPack_4.6_Linux_GA_P3448-0020/Linux_for_Tegra/ and run: "sudo ./apply_binaries.sh"

Flashing Instructions

1. Connect the Nano and Carrier to the computer via USB following the instructions in the appropriate manual.
2. Put the system to be flashed into recovery mode, following the instructions in the appropriate manual
3. To flash on the Nano, use the following (do not add ".conf"):
CTI Assisted Flashing: ./cti-flash.sh
Manual Flash: ./flash.sh cti/nano/photon mmcblk0p1
4. Once the flashing has completed, the Nano will reboot
5. To switch between different boards, you will need to repeat these steps or run "sudo cti-nano-fdt.sh"

Product Specific Details

NGX003 (Photon)

- USB 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

Note: Automatic Login Functionality not supported, currently an open issue with NVIDIA

NGX004 (Quark)

- USB 3.0 Support
- USB OTG Support
- MIPI Camera Support
- Micro SD Card Support
- Ethernet
- GbE PCI Support
- UART Support
- I2C Support
- GPIO Support
- SPI Support
- PWM (Note, as of this revision, only works on pin 38 of the I/O header)
- Fan

NGX007 (Boson)

- USB 3.0 Support
- USB OTG Support
- FRAMOS Camera Support
- Display(HDMI)
- Micro SD Card
- GbE Phy Support
- UART Support
- SPI Support
- I2C Support
- PWM Support
- NVMe Card Support

Note: Automatic Login Functionality not supported, currently an open issue with NVIDIA

Changes

Version NANO-32.6.1 V004, Dec 10, 2021

- Adding support for FRAMOS IMX290/IMX327/IMX462 to Boson carrier
- Adding support for ECON e-CAM80_CUNANO to Photon and Quark carrier
- New naming convention for conf files to include camera provider

Version NANO-32.6.1 V003, Oct 6, 2021

- Adding support for FRAMOS IMX334 to Boson carrier

Version NANO-32.6.1 V002, Sept 21, 2021

- Adding support for Boson carrier

Version NANO-32.6.1 V001, August 26, 2021

- Initial release on Jetpack 4.6 L4T 32.6.1

Version NANO-32.5 V001, Feb 19, 2020

- Initial release on Jetpack 4.5 L4T 32.5

Version NANO-32.4.4 V003, Jan 14, 2021

- Added support for Arducam 12.3MP IMX477 HQ Camera Module for Photon and Quark.

Version NANO-32.4.4 V002, Jan 07, 2021

- Added support for ECON AR0330 and AR0521 camera sensor

Version NANO-32.4.4 V001, Oct 29, 2020

- Initial release on Jetpack 4.4 L4T 32.4.4
- Resolved "disagrees about module layout" issue for loading external kernel modules.

Version NANO-32.4.3 V003, Oct 21, 2020

- Added support for Vision Components Camera sensor: IMX327c and OV9281

Version NANO-32.4.3 V002, Oct 05, 2020

- Supports apt-get upgrade
- Upgrade support from cti debian server from this version onwards
- Installs a script to enable DTB switching using dd command
- Script: cti-nano-fdt.sh
- Install path: /usr/bin

Version NANO-32.4.3 V001, July 27, 2020

- Initial release on Jetpack 4.4 L4T 32.4.3

Version NANO-32.4.2 V001, June 05, 2020

- Initial release on Jetpack 4.4 L4T 32.4.2

Version NANO-32.3.1 V005, May 29, 2020

- Fixed login loop issue
- Added deb packages

Version NANO-32.3.1 V004, May 06, 2020

- Previous release is broken
- Quark is not supported.
- NVME issue is resolved.
- Fixed install script.

Version NANO-32.3.1 V003, Apr 15, 2020

- Added support for Quark

Version NANO-32.3.1 V001, Feb 28, 2020

- Initial release on Jetpack 4.3

Version NANO-32.2.1 V001, Jan 09, 2020

- Initial release on Jetpack 4.2.2

Version 300, September 11, 2019

- Initial Release for the Nano

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	<p>Please go to the Connect Tech Resource Center for product manuals, installation guides, device drivers, BSPs and technical tips.</p> <p>Submit your technical support 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>support@connecttech.com sales@connecttech.com www.connecttech.com</p> <p>Toll Free: 800-426-8979 (North America only) Telephone: +1-519-836-1291 Facsimile: 519-836-4878 (on-line 24 hours)</p>