Connect Tech

BOARD SUPPORT PACKAGE

For Connect Tech NVIDIA Jetson Xavier-NX Carriers

BSP Version: XAVIER-NX-35.1.0-V001
Last Updated: 2022/11/04

1.1 Introduction

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

Please check Section 3. For supported features for your board and Section 7 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/

1.2 Requirements

- x86/x64 based host machine running Ubuntu 18.04 or 20.04
- JetPack 5.0.2 / L4T 35.1.0 installed (see Section 4)
- Xavier-NX module
- Connect Tech Xavier-NX Carrier
- USB Cable for flashing

*L4T version can be found in /etc/nv_tegra_release and will look like this:
R35 (release), REVISION: 1.0

1.3 BSP Features

1.3.1 Product Specific Details

NGX003 (Photon)

- USB 3.0 Support

- USB OTG Support
- HDMI Support
- Micro SD Card Support
- NVMe Card Supportt
- Wifi/Bluetooth Card Support
- Cellular Card Support
- RGB LED Support
- UART Support
- I2C Support
- GPIO Support

NGX004 (Quark)

- USB 3.0 Support
- USB OTG Support
- Micro SD Card
- GbE Phy Support
- CAN Support
- UART Support
- I2C Support
- GPIO Support
- SPI Support
- PWM Support

NGX006 (Rudi-NX)

- USB 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 3.0 Support
- USB OTG Support
- Display(HDMI)
- Micro SD Card
- GbE Phy Support
- CAN Support

- UART Support
- SPI Support
- I2C Support
- PWM Support
- Wifi/Bluetooth Support
- NVMe Card Support

1.3.2 Limitations and Known Issues

1. Nvme performance in Jetpack 5.0.2 is about half of what it was in previous l4ts..

2. OTA deb package update is currently not supported in this package. Please do not run apt-get upgrade nvidia-l4t-kernel, as you can break the OS.

3. This package does not support any cameras. This is due to the large jump from kernel 4.9 to 5.10, requiring new driver sources from our vendors. Requests for new sources are pending.

4. During development, we ran into many issues that had to be patched in Jetpack 5.0.2 (l4t 35.1.0). There could be bugs in Nvidia's drivers that we have yet to discover. If you need a reliable BSP with plenty of driver and camera support use Jetpack 4.6.2 (l4t 32.7.2) or wait for Jetpack further releases.

1.4 Installation

1.4.1 Obtaining Nvidia Jetpack

Before Installing the BSP you will need to install JetPack 5.0.2 on the host system using the NVIDIA SDK Manager (section 4.1.1) or from the Nvidia Embedded Download Center (section 4.1.2)

1.4.1.1 Installing Jetpack from SDK Manager

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

1.4.1.2 Installing Jetpack from Nvidia Embedded Download Center

1. Create a new directory for installing Jetpack. Referred to as <BSP_ROOT> in these instructions

2. Go to Jetpack Release Page https://developer.nvidia.com/embedded/jetson-linux-r351

3. Download the "L4T Driver Package (BSP)" and "Sample Root Filesystem" files for Xavier-NX.

4. Put the "L4T Driver Package (BSP)" "Sample Root Filesystem" in <BSP_ROOT>. Afterwards, you should have the following files in <BSP_ROOT>
   jetson_linux_r35.1.0_aarch64.tbz2
   tegra_linux_sample-root-filesystem_r35.1.0_aarch64.tbz2

5. Extract the "L4T Driver Package" tarball:

   cd <BSP_ROOT>
   sudo tar -jxf jetson_linux_r35.1.0_aarch64.tbz2

6. You should now have a new directory called Linux_for_Tegra in your <BSP_ROOT> folder. Extract the "Sample Root Filesystem" into Linux_for_Tegra/rootfs.

   sudo tar -C Linux_for_Tegra/rootfs/ -xjf tegra_linux_sample-root-filesystem_r35.1.0_aarch64.tbz2

1.4.2 CTI BSP Installation

1. Copy the CTI-L4T-XAVIER-NX-32.5.1-V###.tgz package into <BSP_ROOT>/Linux_for_Tegra.

   If using Nvidia's SDK manager then "<BSP_ROOT>" will be:
   ~/nvidia/nvidia_sdk/<JetPack_Version>_Linux_JETSON_ XAVIER_NX _TARGETS/

   Otherwise if manually installing from Nvidia Embedded Download Center <BSP_ROOT> will be the folder created previously

   cp CTI-L4T- XAVIER-NX -32.5.1-V###.tgz <BSP_ROOT>/Linux_for_Tegra

2. Extract the BSP: tar -xzf CTI-L4T- XAVIER-NX -32.5.1-V###.tgz
   cd <BSP_ROOT>/Linux_for_Tegra
   sudo tar -xzf CTI-L4T- XAVIER-NX -32.5.1-V###.tgz

3. Change into the CTI-L4T directory:
   cd <BSP_ROOT>/Linux_for_Tegra/CTI-L4T

4. Run the install script (as root or sudo) to automatically install the BSP files to the correct locations:

   sudo ./install.sh
   #return to Linux_for_Tegra
   cd ..

5. The CTI-L4T BSP is now installed on the host system and it should now be able to flash the Xavier-NX module.

1.5 Flashing XAVIER-NX Modules

1. Connect the Xavier-NX 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 Xavier-NX use the following (do not add ".conf" in <config>):

   Manual Flash: ./flash.sh cti/<module>/<boardname>/<config> mmcblk0p1

   <module> is xavier-nx for all Xavier-NX modules

   Example:
   ./flash.sh cti/ xavier-nx/photon/base mmcblk0p1

   Alternativley the provided cti-flashing script can be used as such "./cti-flash", after running you will be provided a menu, select the relevant options and the command shown above should be generated.

4. Once the flashing has completed, the Xavier-NX will reboot

1.6 Upgrading to a New Package Release

Upgrading L4T or CTI-BSP verisons without reflashing is not currently supported. Support for upgrades via apt and OTA packages will be added in the future

1.7 Switching Profiles on Xavier-NX

1. Open a terminal on the Xavier-NX
2. Run "sudo cti-nx-fdt.sh"
3. Select the profile you wish to switch to from the menu
4. Restart the system

Note: This script updates the dtb by appending/replacing the FDT variable in extlinux.conf
It also sets root=/dev/mmcblk0p1 by modifying the "APPEND" variable

1.8 Change Log

Version XAVIER-NX-35.1.0 V001, Nov 4, 2022

- Initial Release for XAVIER-NX Carriers

1.9 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. 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.
Contact Information	support@connecttech.com sales@connecttech.com www.connecttech.com Toll Free: 800-426-8979 (North America only) Telephone: +1-519-836-1291 Facsimile: 519-836-4878 (on-line 24 hours)