Connect Tech

BOARD SUPPORT PACKAGE

For Connect Tech NVIDIA Jetson AGX Xavier Carriers

BSP Version: AGX-AVT-32.5 V005

Last Updated: 2021/05/20

Introduction

This Board Support Package adds support for Connect Tech Jetson AGX Xavier 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 4.5 installed (from NVIDIA Embedded Download Center)
- AGX Xavier module
- Connect Tech AGX Xavier Carrier
- USB Cable for flashing
- L4T 32.5

*L4T version can be found in /etc/nv_tegra_release and will look like this:
R32 (release), REVISION: 5.0
*CTI version can be found in /etc/cti/CTI-L4T.version and will look like this:
V002

Supported Cameras in BSP

- Allied Vision Alvium 1500 C and 1800 C sensors.

Installation

1. Before Installing the BSP you will need to install JetPack 4.5 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-AGX-AVT-32.5-V005.tgz package into ~/nvidia/nvidia_sdk/JetPack_4.5_Linux_JETSON_AGX_XAVIER/Linux_for_Tegra/

3. Extract the BSP:
   tar -xzf CTI-L4T-AGX-AVT-32.5-V005.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 AGX Xavier module.

7. To flash on the AGX Xavier use the following (do not add ".conf"):
   CTI Assisted Flashing: ./cti-flash.sh
   Manual Flash: ./flash.sh cti/<module>/<boardname> mmcblk0p1
   Examples:
      ./flash.sh cti/xavier/rogueX mmcblk0p1
      ./flash.sh cti/xavier-8G/rogue-IMX274 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)

- Go to https://developer.nvidia.com/embedded/linux-tegra-archive and click on the green button labeled "32.5 >".

- Download the "L4T Driver Package (BSP)" and "Sample Root Filesystem" files for AGX Xavier. Afterwards, you should have the files "Tegra186_Linux_R32.5_aarch64.tbz2" and "Tegra_Linux_Sample-Root-Filesystem_R32.5_aarch64.tbz2".

- Create a directory named ~/nvidia/nvidia_sdk/JetPack_4.5_Linux_JETSON_AGX_XAVIER/ and copy the "Tegra186_Linux_R32.5_aarch64.tbz2" file you downloaded into that directory.

- Unzip the tarball:
  "sudo tar jxf Tegra186_Linux_R32.4.4_aarch64.tbz2"

- You should now have a new directory called Linux_for_Tegra in your "JetPack_4.5_Linux_JETSON_AGX_XAVIER" folder. Change directories into that and then copy the "Tegra_Linux_Sample-Root-Filesystem_R32.5_aarch64.tbz2" file you downloaded into the rootfs folder inside.

- Change into the rootfs folder and unzip the tarball:
  "sudo tar jxf Tegra_Linux_Sample-Root-Filesystem_R32.5_aarch64.tbz2"

- If you wish to flash one of NVIDIA's devkits, or move on to installing CTI's BSP. You can change directories back to ~/nvidia/nvidia_sdk/JetPack_4.5_Linux_JETSON_AGX_XAVIER/Linux_for_Tegra/ and run:
  "sudo ./appy_binaries.sh"

Flashing Instructions

- Connect the AGX Xavier 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/<module>/<board> mmcblk0p1" from Linux_for_Tegra directory
- Once the flashing has completed, the Xavier will reboot
- To switch between different boards, you can repeat these steps. Alternatively follow the instructions below for runtime switching profiles on the Xavier

Switching Profiles on Xavier

- Open a terminal on the Xavier
- Run "sudo cti-agx-fdt.sh"
- Select the profile you wish to switch to from the menu
- Restart the system

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

Product Specific Details

AGX101 (Rogue)

- CAN Support
- USB Support
- GbE Phy Support
- Supports JCB005 adapter with up to 6 cameras
- SPI support

JCB005 (Allied Vision MIPI Camera Board)

- 4 Quad Lane MIPI CSI-2 Support
- 6 Dual Lane MIPI CSI-2 Support
- GPIO Support

Changes

Version AGX-AVT-32.5 V005, May 20, 2021

- Supports Allied Vision Camera on JCB005 adapter board on AGX101(Rogue).
- Added support for jumper to switch between internal and external GPIOs.
- Note: This package does not support other camera sensors.

Version AGX-AVT-32.5 V002, Mar 18, 2021
- Supports Allied Vision Camera on JCB005 adapter board on AGX101(Rogue).
- Supports 4-Camera and 6-Camera profiles.
- Note: This package does not support other camera sensors.

Version AGX-32.5 V001, Feb 05, 2021
- Initial release on Jetpack 4.5 L4T 32.5
- IMX390 cameras not supported
- Bootloader OTA upgrades are supported.

Version AGX-32.4.4 V004, Jan 14, 2021
- Supports IMX274 MIPI camera on Leopard 6 camera adapter board on AGX101(Rogue) and AGX103 (RogueX).
- Supports up to 6 Cameras.
- Note: This package does not support other camera sensors or adaptor boards.

Version AGX-32.4.4 V003, Dec 09, 2020
- Resolves "disagrees about module_layout" issue for loading external kernel modules
- Note: This package does not support Allied Vision Camera on JCB005 adapter.

Version AGX-32.4.4 V002, Dec 07, 2020
- Supports Allied Vision Camera on JCB005 adapter board on AGX101 (Rogue).
- Supports 4-Camera and 6-Camera profiles.
- Note: This package does not support other camera sensors.

Version AGX-32.4.4 V001, Nov 13, 2020
- Initial release on JetPack 4.4.1 L4T 32.4.4

Version AGX-32.4.3 V002, October 15, 2020
- Added color patch from Leopard for IMX390 camera
  - This supports single camera
- Upgrade support from cti debian server from this version onwards
- Supports apt-get upgrade
- Installs a script to modify extlinux.conf to switch dtb
- Script: cti-agx-fdt.sh
- Install path: /usr/bin
- Execute: sudo cti-agx-fdt.sh
- Recommended: perform power cycle when switching between camera profiles using extlinux.conf(cti-agx-fdt.sh)
- Set power mode as "MAXN" when running all 8 cameras to avoid any lag

Version AGX-32.4.3 V001, July 29, 2020
- Initial release on JetPack 4.4 L4T 32.4.3

Version AGX-32.4.2 V002, June 15, 2020
- Added support for JCB004 IMX390 and E-Con cameras on dev kit
- Added support for JCB002 E-Con camera on rogue/rogueX
- Added support for Elroy, Spacely on Mimic

Version AGX-32.4.2 V001, June 05, 2020
- Initial release

Version AGX-32.3.1 V006, May 29, 2020
- Fixed login loop
- Added deb packaged

Version AGX-32.3.1 V004, May 07, 2020
- Fixed issue with install.sh script

Version AGX-32.3.1 V004, Feb 24, 2020
- Added support for Leopard IMX390 cameras on JCB004 for Xavier devkit

Version AGX-32.3.1 V003, Feb 14, 2020
- Added support for E-CON AR0330 cameras on JCB004 for Xavier devkit

Version AGX-32.3.1 V002, Feb 13, 2020
- Added support for E-CON AR0330 cameras on JCB002 for Rogue and RogueX

Version AGX-32.3.1 V001, Feb 06, 2020
- Initial version for JetPack 4.3 (L4T 32.3.1)
- Added JCB002 adapter support to RogueX
- Fixed eth0 hotplug issue
- Prevented i2c error message from appearing in dmesg logs of modules with no camera support
- Added SPI support

Version AGX-32.2.1 V003, Dec 23, 2019
- Fixed cti-flash.sh to support flashing
- Corrected verbose in install.sh

Version AGX-32.2.1 V002, Dec 10, 2019
Support for Xavier 8GB module for Rogue and Rogue X carriers

Version AGX-32.2.1, Dec 05, 2019
- Initial Release for JetPack 4.2.2 (L4T 32.2.1)

Version AGX-32.1.0, Nov 08, 2019
- Added camera support (MIPI CSI Expansion)

Version AGX-32.1.0, Nov 04, 2019
- Initial Release

Version 203, Jun 17, 2019
- Added Rogue Camera Support
- Fixed an Issue Where Some Modules Would Not Flash

Version 202, Apr 30, 2019
- Changed Kernel Name to 4.9.104-tegra

Version 201, Apr 8, 2019
- Initial Release for the Mimic and Rogue JetPack 4.2 (L4T 32.1.0)

Version 200, Mar 15, 2019
- Initial Release for the Mimic and Rogue JetPack 4.1 (L4T 31.1.0)

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)