NVIDIA

JETSON TX1 AND TX2 DEVELOPER KITS

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User Guide
Release 28.2



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JETSON TX1 AND TX2 DEVELOPER KITS

The NVIDIA® Jetson™ TX1 and TX2 Developer Kits provide a full-featured development platform for AI and visual computing that is ideal for applications requiring high computational performance in a low power envelope.

The Jetson TX1 and TX2 Developer Kits are designed to get you up and running quickly:

- Pre-flashed with a Linux environment
- Includes support for many common APIs
- Supports the NVIDIA development toolchain

The Developer Kit carrier board exposes many standard hardware interfaces, enabling a highly flexible and extensible platform.

JetPack, the Jetson SDK, supports your Jetson Developer Kit and host development platform, and includes:

- An OS image to load onto your device
- Developer tools
- Supporting documentation
- Code samples to help you get started

Individual development efforts vary and may result in modifications to the system configuration. For best results, begin with the basic system configuration as shipped to ensure proper system operation prior to any further development.

For software updates and the latest JetPack, see:

```
http://developer.nvidia.com/embedded-computing
```

Prerequisites

- A Jetson TX1 or TX2 Developer Kit

- Your carrier board must be cabled as follows:
  - An Ethernet cable plugged into the on-board Ethernet port.
  - An HDMI cable connecting the carrier board to an external HDMI display.
  - To connect multiple USB peripherals such as keyboard, mouse, and USB/Ethernet adapter for network connection, a USB hub must be connected to the carrier board USB port. This USB hub is not provided as part of the Developer Kit.
  - If a serial console on the Linux host is desired, a serial cable must be plugged into the serial port on the target and connected to your Linux host directly or through a serial-to-USB converter.

Powering Up

1. Connect a USB keyboard to the USB Type A connector of your device.
2. Connect an HDMI-compatible display to the HDMI connector on your device.
3. Connect the AC adapter supplied in your kit to the power connector of your device. Use the supplied AC adapter since it is appropriately rated for your device.
4. Plug the power adapter into an appropriately rated electrical outlet.

   The system powers on. If not, press and release the power button on the device.

5. When prompted, enter `nvidia` for both the user name and password.

Force Recovery Mode

To update your system, you must be in Force USB Recovery Mode (RCM) so that you can transfer system software to the Jetson TX1 or TX2 module. When in Force USB Recovery Mode, you can update system software and write to the boot loader, boot configuration table (BCT), and write partition configuration to the device.

For OS-specific instructions when updating system software on your Jetson TX1 or TX2, see the Developer SDK documentation.

To place system in Force USB Recovery Mode

1. Power down the device. If connected, remove the AC adapter from the device. The device **must** be powered OFF, and **not** in a suspend or sleep state.
2. Connect the Micro-B plug on the USB cable to the Recovery (USB Micro-B) Port on the device and the other end to an available USB port on the host PC.
3. Connect the power adapter to the device.
4. With the system powered on:
   - Press and hold the RECOVERY FORCE button.
   - While depressing the RECOVERY FORCE button, press and release the RESET button.
   - Wait 2 seconds and release the RECOVERY FORCE button.

FLASHING THE BOOT LOADER AND KERNEL

This topic describes the steps required for flashing and booting the target Tegra device. Usage information is also provided for the `flash.sh` helper script.

The flashing procedure flashes the board with the boot loader and the kernel. Optionally, you can also flash the root filesystem to the internal eMMC.

Prerequisites

The following directories must be present:

- `/bootloader`—boot loader and flashing tools such as NvFlash, CFG, BCT, etc.
- `/kernel`—a kernel zImage /vmlinux.uimg, DTB files, and kernel modules.
- `/rootfs`—the root file system that you download. This directory is empty initially, you populate it with the sample file system.
- `/nv_tegra`—NVIDIA® Tegra® user space binaries and sample applications.

Additionally, a USB cable is required and must be connected to the recovery port prior to running the flashing commands.

To flash the target device

1. Put the target board into reset/recovery mode as follows:
   - Power on the board.
   - Hold the recovery button and then press the reset button
2. Run the `flash.sh` script that is in the top-level directory of this release.

   The script must be supplied with the target board (`jetson-tx1` or `jetson-tx2`) for the root file system:

   ```
   $ sudo ./flash.sh <platform> <rootdev>
   ```

   - If the root file system will be on a USB disk, execute the script as follows:

   ```
   $ sudo ./flash.sh <platform> sda1
   ```

   - If a SATA device is connected, that device enumerates as `sda1`.
   - If the root file system will be on an SD card, execute the script as follows:

   ```
   $ sudo ./flash.sh <platform> mmcblk1p1
   ```

   - If the root file system will be on the internal eMMC, execute the script as follows:

   ```
   $ sudo ./flash.sh <platform> mmcblk0p1
   ```

Where `<platform>` is `jetson-tx1` or `jetson-tx2`.

The above examples are for u-boot. For fastboot flashing, add the following argument:

```
-L <PATH_TO_FASTBOOT_BIN_FILE>
```

The boot loader and kernel loads.

For more information on U-Boot, see U-Boot Customization.

Flash Script Usage

Detailed usage information is available by running the following command:

```
flash.sh –h
```

Usage

```
sudo ./flash.sh [options] <platform> <rootdev>
```

Specify the required parameters and one or more of the options as follows.

Parameters	Description	
<platform>	Is `jetson-tx1` or `jetson-tx2`.	
<rootdev>	Is one of following:	
	mmcblk0p1	Specifies internal eMMC.
	mmcblk1p1	Specifies external SDCARD.
	sda1	Specifies external USB device (such as, USB memory stick or HDD).
	eth0	Specifies nfsroot via external USB Ethernet interface.
Options	**Description**	
-h	Specifies to print this usage information.	
-b <bctfile>	Specifies the NvFlash Boot Configuration Table (BCT) file.	
-c <cfgfile>	Specifies the NvFlash configuration file.	
-d <dtbfile>	Optionally specifies a device tree file to use instead of the default.	
-e <emmc_file>	Specifies the eMMC size of the target device.	
-f <flashapp>	Specifies the path to flash application: nvflash or tegra-rcm.	
-i	Specifies to pass the user kernel command line to the kernel as-is.	
-k <partition id>	Specifies the kernel partition ID to be updated (minimum = 5).	
-n <nfs args>	Specifies the static NFS network assignments:	

	`<Client IP>:<Server IP>:<Gateway IP>:<Netmask>`
-o <odmdata>	Specifies the ODM data value.
-p	Total eMMC HW boot partition size.
-r	Specifies to skip building and reuse existing `system.img`.
-s <ubootscript>	Specifies the boot script file for U-Boot.
-C <cmdline>	Specifies the kernel command line. **Warning**: Each option in this kernel command-line gets higher precedence over the same option from fastboot. In case of NFS booting, this script adds NFS booting related arguments if the -i option is omitted.
-F <flasher>	Specifies the flash server, such as `fastboot.bin`.
-I <initrd>	Specifies `initrd` file. Null `initrd` is the default.
-K <kernel>	Specifies the kernel image, such as zImage.
-L <bootloader>	Specifies the full path to the boot loader, such as `fastboot.bin` or `u-boot.bin`.
-P <end_of_PPT_plus_1>	Specifies the sum of the primary GPT start address, the size of PPT, plus 1.
-R <rootfs dir>	Specifies the sample rootfs directory.
-N <nfsroot>	Specifies the nfsroot, for example: `<my IP addr>:/my/exported/nfs/rootfs`
-S <size>	Specifies the rootfs size in bytes. This is valid only for internal rootdev. KiB, MiB, GiB style shorthand is allowed. For example, 1GiB signifies 1024 * 1024 * 1024 bytes.
-T <ITS file>	ITS file name. Valid only for u-boot.

JETPACK

NVIDIA® JetPack is a comprehensive SDK for AI and visual computing, and automates installation of a development environment for the NVIDIA Jetson Platform. It makes it easy to flash your Jetson system with the latest OS images. JetPack includes:

- Host and target tools
- APIs
- Packages such as middleware, samples, and documentation including help for compiling samples

Using JetPack enables you to jumpstart your environment and begin developing.

Supported Host Operating Systems

- Ubuntu Linux x64 Version 14.04

At least 10 GB of disk space is required for the complete installation of JetPack.

Target Platform Requirements

Jetson Developer Kit connected as follows:

- A USB Micro-B cable connecting the Jetson system to your Linux host for flashing.
- To connect USB peripherals such as a keyboard, mouse, and USB/Ethernet adapter for network connection, a USB hub must be connected to the working USB port (J1C2 USB2) on the Jetson system. This USB hub is not included in the Developer Kit.
- An HDMI cable is plugged into the Jetson system HDMI port, which is connected to an external HDMI display.
- An Ethernet cable is plugged into the on-board Ethernet port.
- If a serial console on the Linux host is desired, a serial cable must be plugged into the serial port J1A2 UART4 on the target and connected to your Linux host directly or through a serial-to-USB converter.

JetPack Components

JetPack, the Jetson SDK, includes OS images, Libraries and APIs, developer tools, middleware, samples, and documentation.

For more information, see:

```
https://developer.nvidia.com/embedded/jetpack
```

OS Images

JetPack includes a sample file system derived from Ubuntu.

Libraries

JetPack includes the following libraries:

- CUDA Toolkit provides a comprehensive development environment for C and C++ developers building GPU-accelerated applications.
  - CUDA Toolkit for Ubuntu with cross-development support
  - CUDA Toolkit for L4T
- TensorRT and cuDNN for high performance deep learning applications
- VisionWorks and OpenCV for visual computing applications

Developer Tools

JetPack includes the following developer tools:

Tegra Graphics Debugger

A console-grade tool that allows developers to debug and profile OpenGL ES 2.0, 3.0, 3.1, and 3.2, OpenGL 4.3, 4.4, and 4.5, enabling developers to get the most out of the Jetson Platform.

For more information, see:

```
https://developer.nvidia.com/tegra-graphics-debugger
```

Tegra System Profiler

A system trace and multi-core CPU PC sampling profiler that provides an interactive view of captured profiling data, helping improve overall application performance.

For more information, see:

```
https://developer.nvidia.com/tegra-system-profiler
```

PerfKit

A software library that provides access to OpenGL driver and GPU hardware performance counters.

For more information, see:

```
https://developer.nvidia.com/nvidia-perfkit
```

Samples

NVIDIA GameWorks Vulkan and OpenGL samples available at:

```
http://developer.nvidia.com/gameworks-opengl-samples
```

Downloading JetPack

- The latest version of Jetson is available in the NVIDIA Embedded Developer Zone at:

  ```
  https://developer.nvidia.com/embedded/jetpack
  ```

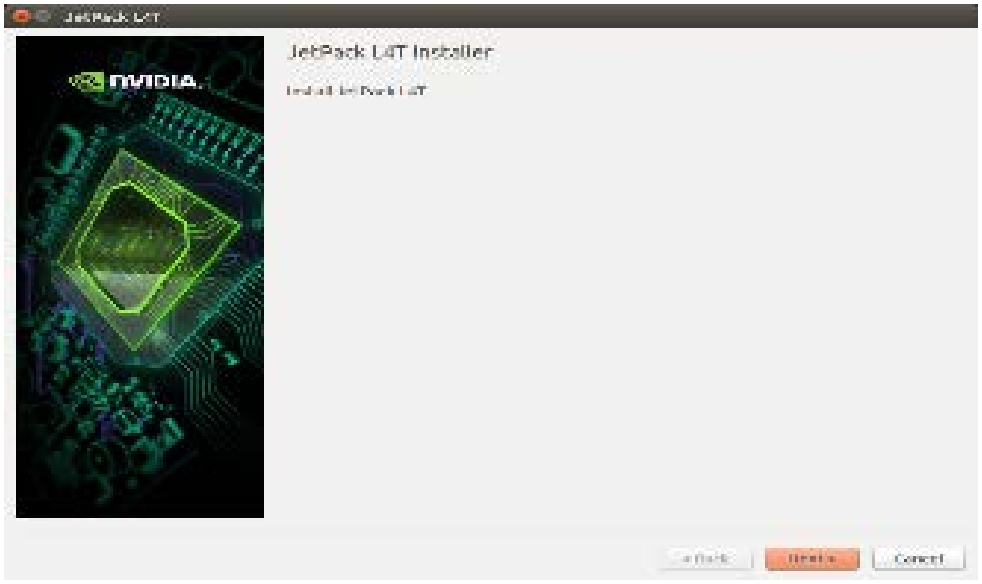
Installing JetPack for Jetson TX1 or TX2

You must download the latest JetPack version, `jetpack-${VERSION}.run`. `${VERSION}` refers to the version string for your installer.

1. Add execute permissions for `jetpack-${VERSION}.run`:

```
chmod +x jetpack-${VERSION}.run
```

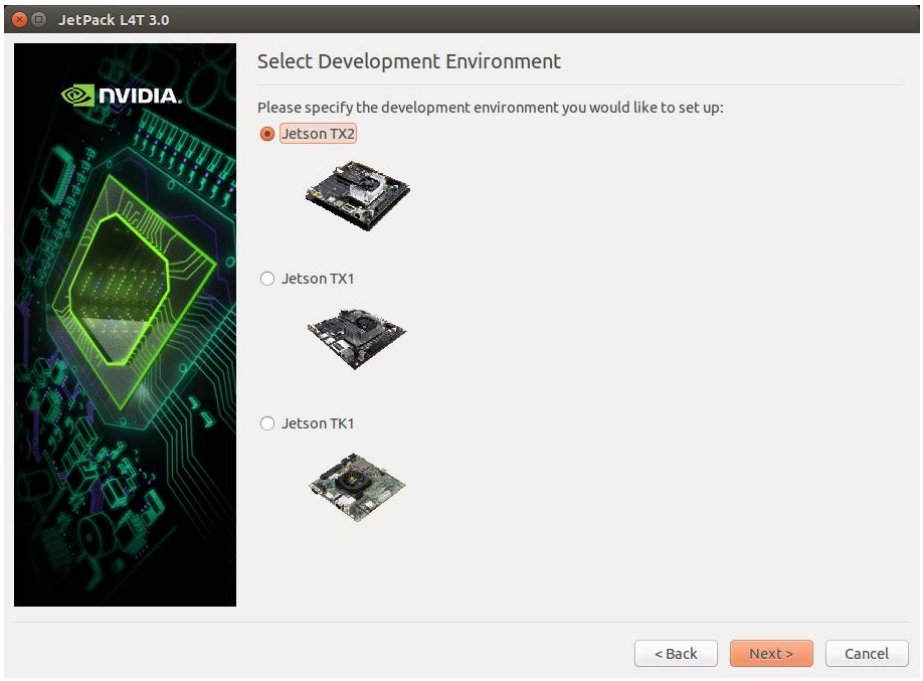
2. Run `jetpack-${VERSION}.run` in a terminal.



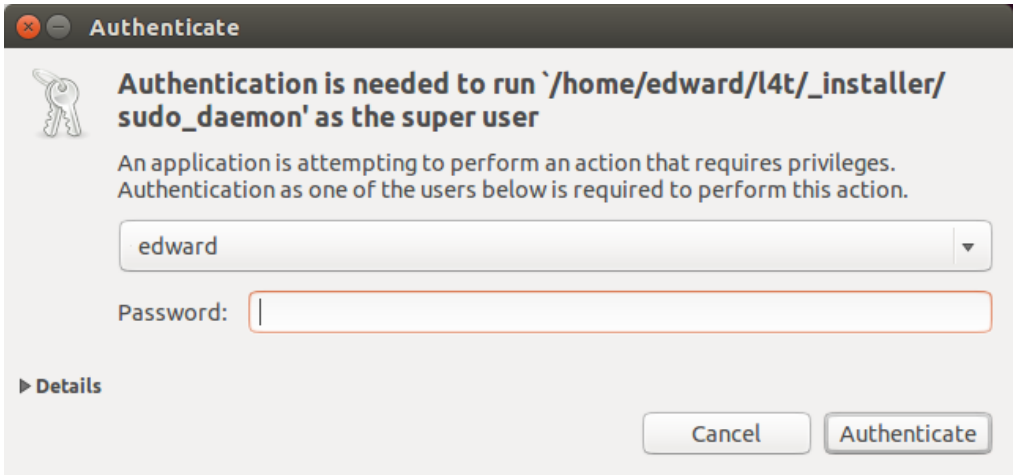
The JetPack installer indicates the installation directory.



3. Select the developer environment to setup.

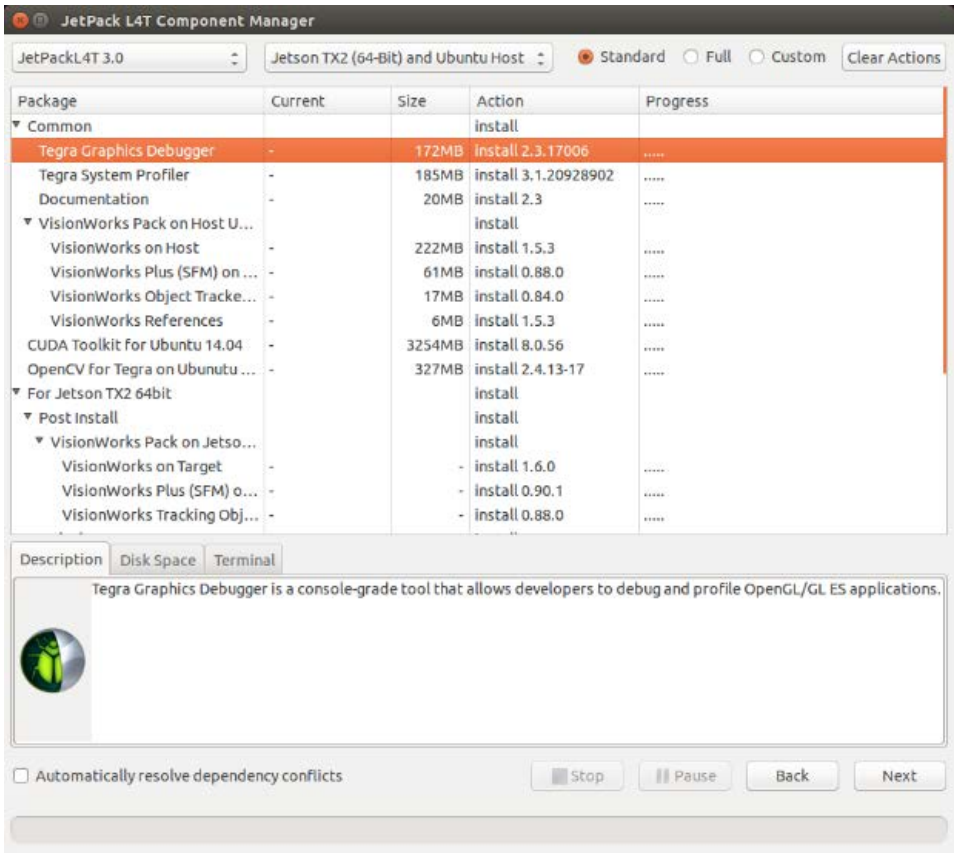


4. The JetPack installer pop-up window displays and prompts for `sudo` permission to use during the installation process. Enter your `sudo` password.



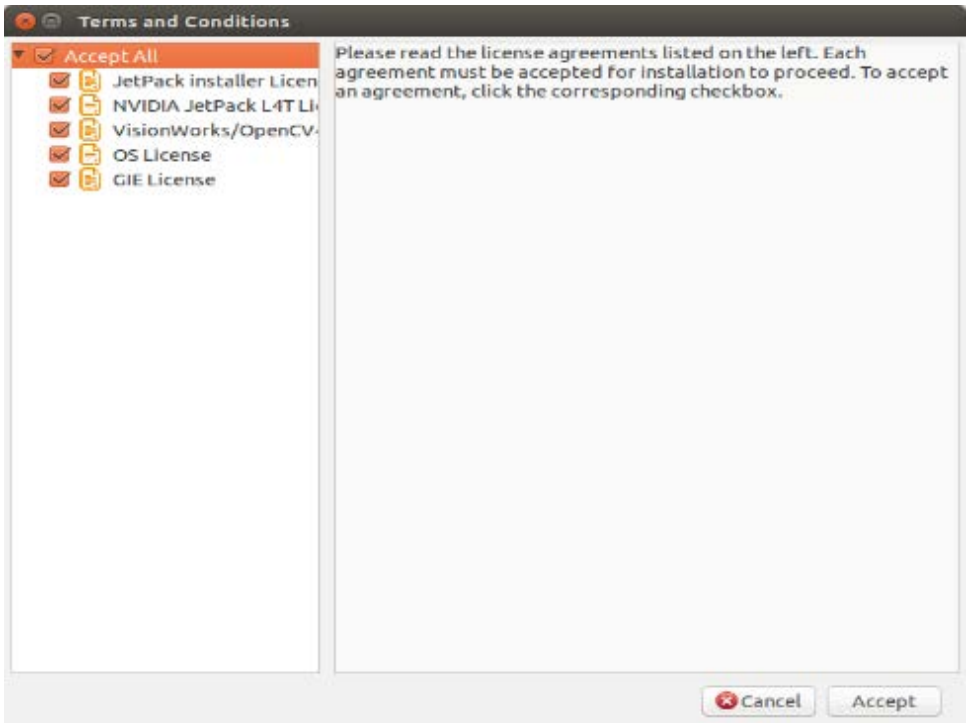
The Component Manager opens, allowing you to customize the components to install.

5. Select the Jetson Developer Kit you are developing to customize the installation components. Jetson TK1 Developer Kit, Jetson TX1 Developer Kit, and Jetson TX2 Developer Kit support is available.



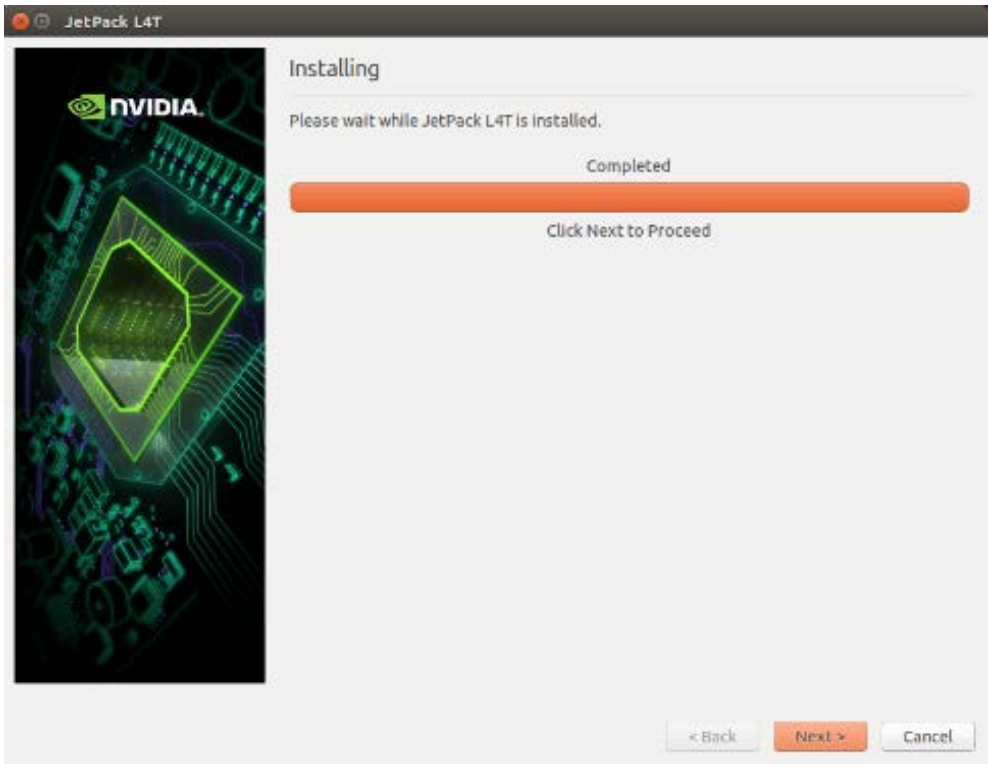
6. To run a standalone Ubuntu install, deselect Jetson target specific entries.

7. Accept the license agreement for the selected components.



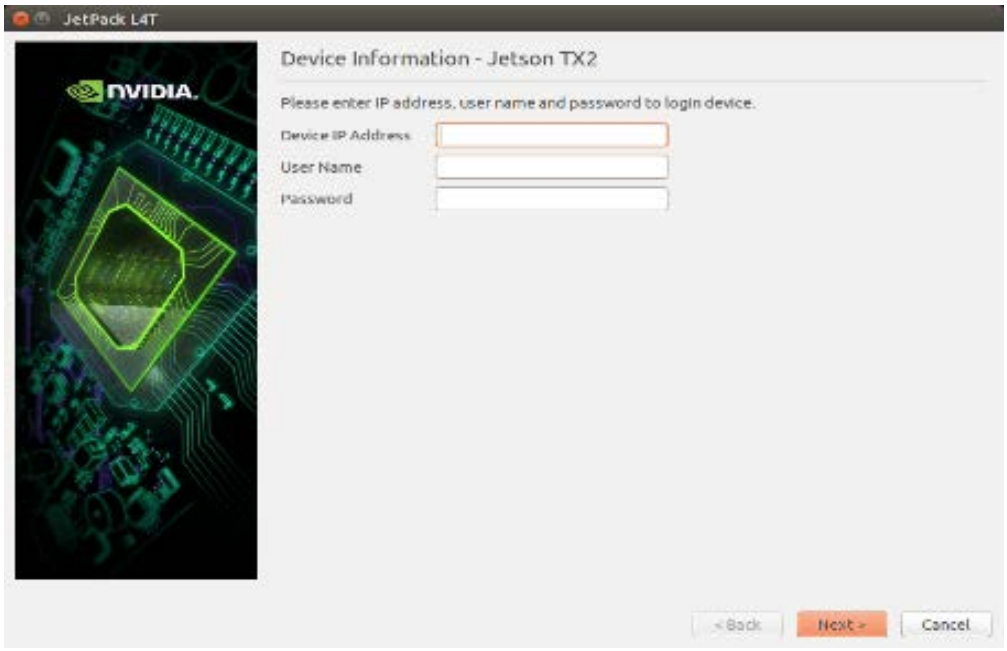
The component manager proceeds with the installation.

8. Once the host installation steps are completed, click the Next button to continue with the installation of the target components.



JetPack proceeds with setting up the Jetson Developer Kit target if the corresponding components were selected. For example, flashing the OS and pushing components to the Jetson Developer Kit target.

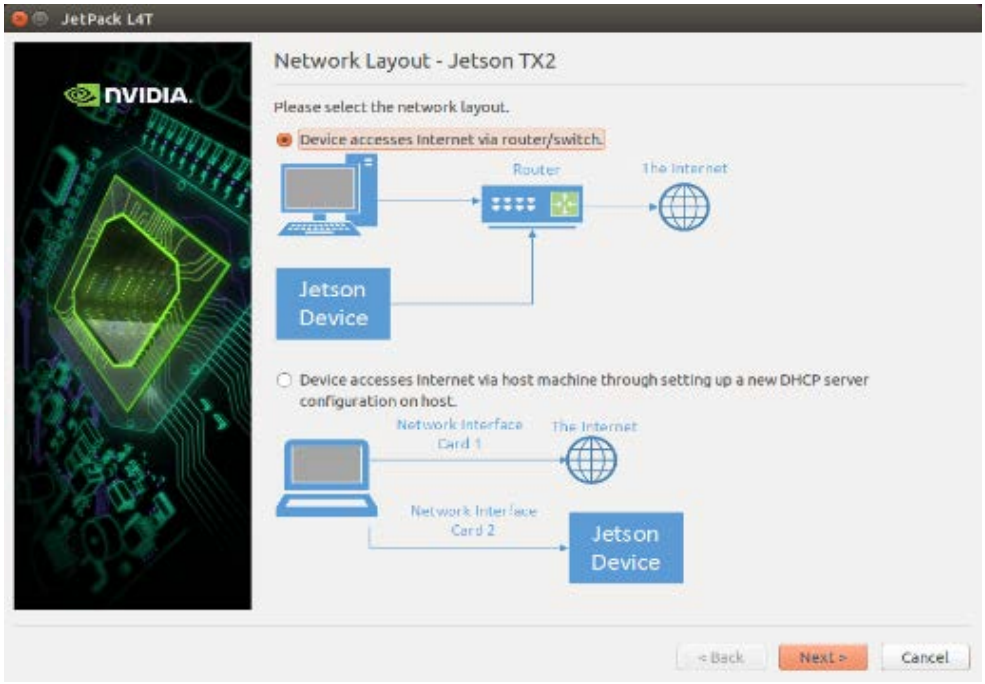
9. If you de-selected Flash OS in the component Manager, you must enter the IP address, user name, and password to set up an ssh connection to the target device.



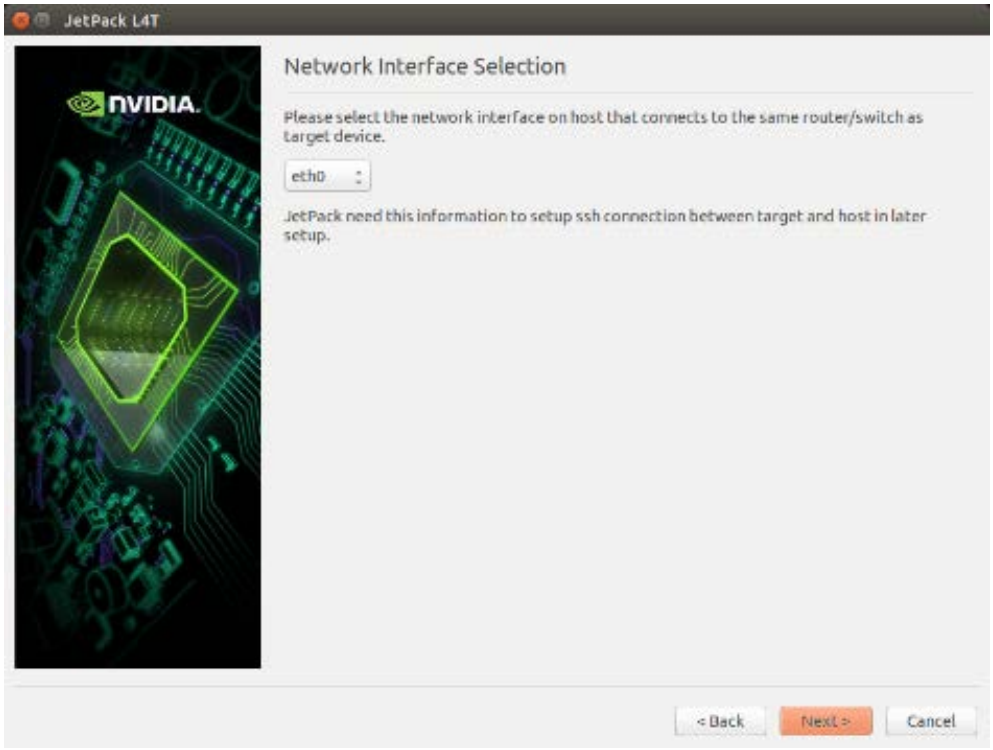
10. After entering the required information click **Next**.

    JetPack installs the components on the target device.

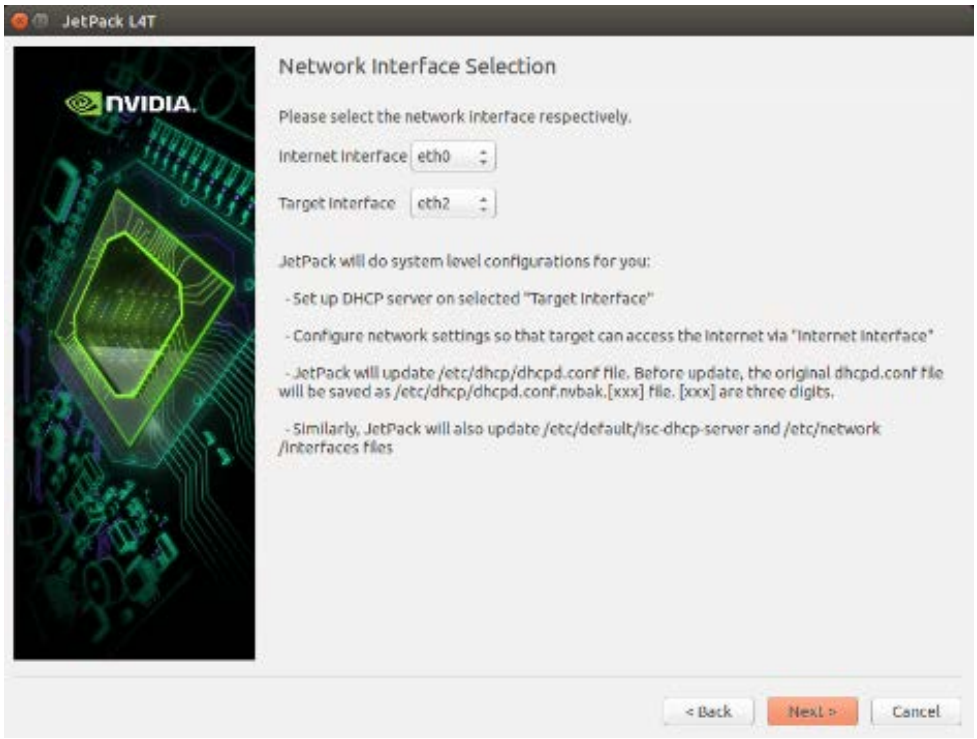
11. If you selected **Flash OS in the Component Manager**, you must select the network layout for your specific environment.



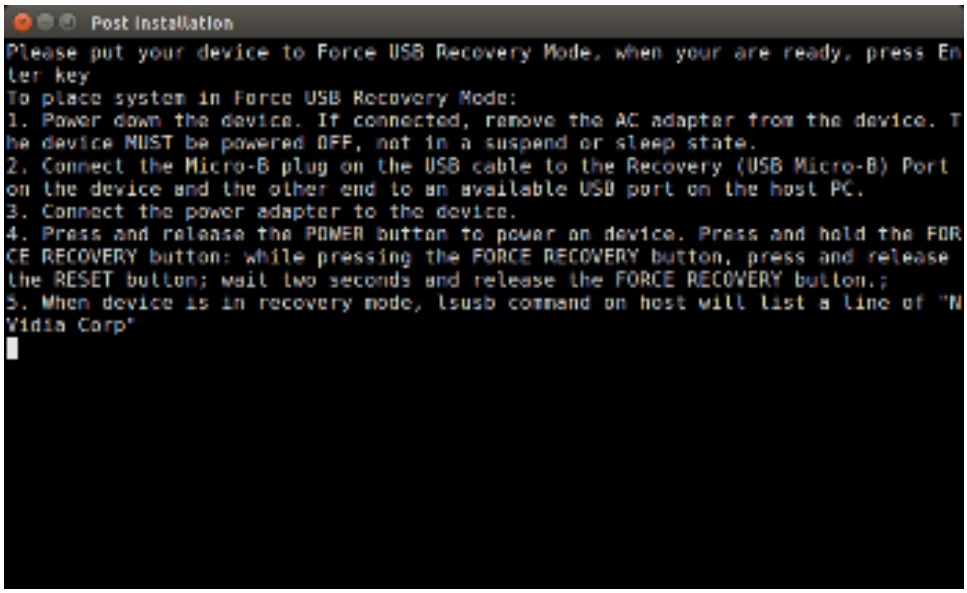
12. If you selected the **Device access Internet via router/switch** layout, you must select which interface to use for Internet access.



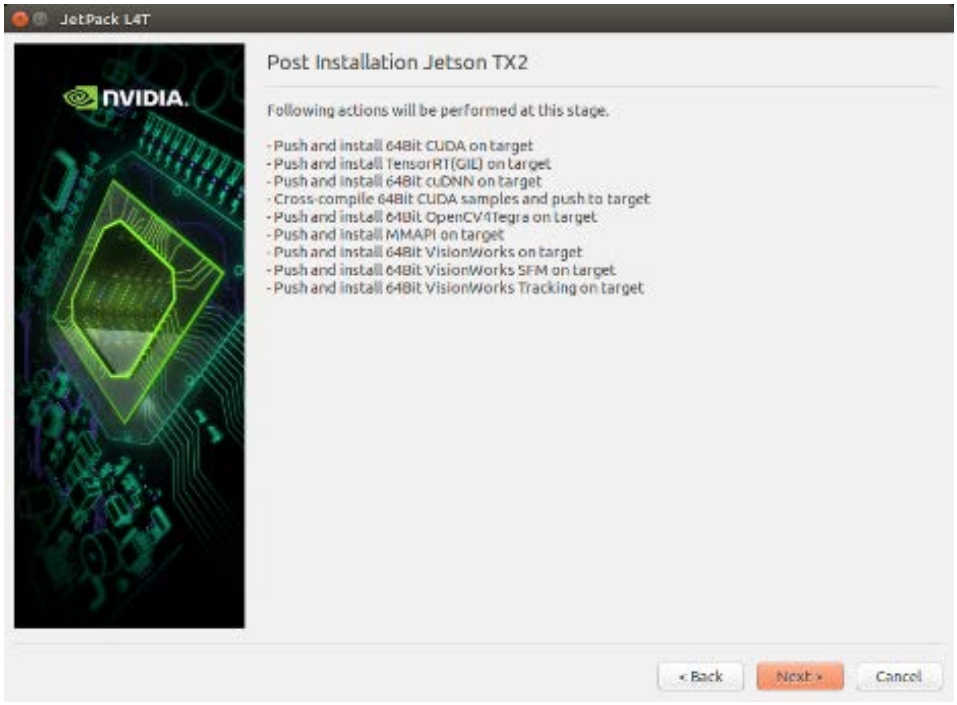
13. If you selected the **Device get IP assigned by DHCP server on host and access Internet via host machine** layout, you must select which interface to use for Internet access and which to use for the target interface.



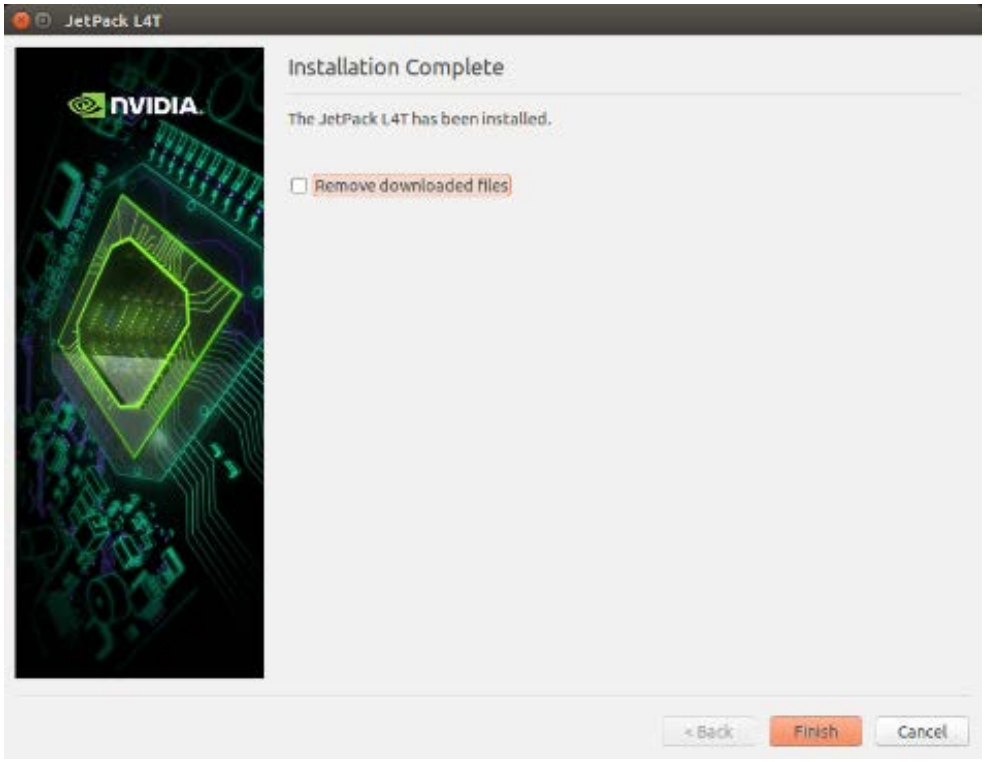
14. A pop-up window displays instructing you to put your device into Force USB Recovery Mode to flash the OS.



15. When prompted, install components on the specific target machine, and compile the samples.



16. After the post installation tasks are completed, the installation is complete.



Compiling

JetPack automatically compiles all samples if Compile Samples is checked during the components selection.

- If you selected CUDA components, CUDA samples are located at:

  ```
  <JetPack_Install_Dir>/NVIDIA_CUDA-<version>_Samples
  ```

  You can recompile the samples by running:

  ```
  SMS=53 EXTRA_LDFLAGS=--unresolved-symbols=
  ignore-in-shared-libs TARGET_ARCH=aarch64 make
  ```

- If you selected GameWorks OpenGL samples, GameWorks OpenGL samples are available at:

  ```
  <JetPack_Install_Dir >/GameWorksOpenGLSamples
  ```

  You can cross compile them by running the `make` command under the following subfolder:

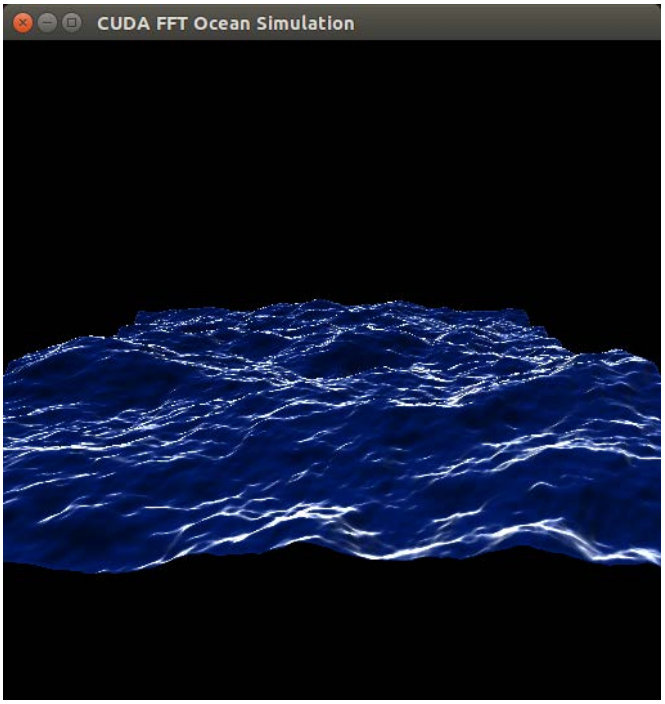
  ```
  samples/build/linux-arm32
  ```

Running JetPack Samples

The CUDA samples directory is copied to the home directory on the device by JetPack. The built binaries are in the following directory:

```
/home/ubuntu/NVIDIA_CUDA-
<version>_Samples/bin/armv7l/linux/release/gnueabihf/
```

Run the samples at the command line or by double-clicking on them in the file browser. For example, when you run the `oceanFFT` sample, the following screen is displayed.



COMPLIANCE

The NVIDIA® Jetson TX1 and TX2 Developer Kits are compliant with the regulations listed in this section. Compliance marks, including the FCC and IC ID numbers, can be found at:

`https://developer.nvidia.com/embedded/support`

United States

Federal Communications Commission (FCC)



Jetson TX1: FCC ID: VOB-P2180
Jetson TX2: FCC ID: VOB P3310

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including any interference that may cause undesired operation of the device.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Warning: The FCC requires that you be notified that any changes or modifications to this device not expressly approved by the manufacturer could void the user's authority to operate the equipment.

RF Radiation Exposure Statement

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

Only those antennas with same type and lesser/equal gain filed under this FCC ID number can be used with this device.

Underwriters Laboratories (UL)

UL Listed Product Logo for Jetson TX2 Developer Kit, model number P2597.



I.T.E E204896

UL Recognized Component Logo for Embedded System Module, model numbers P2180 for Jetson TX1 and P3310 for Jetson TX2.



Canada

Industry Canada (IC)

Jetson TX1: IC: 7361A-P2180
Jetson TX2: IC: 7361A-P3310

CAN ICES-3(B)/NMB-3(B)

This device complies with Industry Canada's license-exempt RSSs. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

The device for operation in the band 5150–5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems.

Only those antennas of the same type and lesser/equal gain, filed under this ID number, can be used with this device.

Note **High-power radars are allocated as primary users (i.e. priority users) of the bands 5250-5350 MHz and 5650-5850 MHz. These radars can cause interference and/or damage to LE-LAN devices.**

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: 1) l'appareil ne doit pas produire de brouillage, et 2) l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Les dispositifs fonctionnant dans la bande de 5 150 à 5 250 MHz sont réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux4;

Seules les antennes du même type et le gain moindre / égal déposé sous ce numéro d'identification peuvent être utilisées avec cet appareil.

Remarque: les utilisateurs de radars de haute puissance sont désignés utilisateurs principaux (c.-à-d., qu'ils ont la priorité) des bandes de 5 250 à 5 350 MHz et de 5 650 à 5 850 MHz et ces radars pourraient causer du brouillage et/ou des dommages aux dispositifs de RL-EL.

RF Radiation Exposure Statement:

Jetson Dev Kit has been tested and complies with ISED RSS 102 RF radiation exposure limits set forth for an uncontrolled environment when used with the NVIDIA accessories supplied or designated for this product. To satisfy IC exposure requirements, a separation distance of at least 20 cm must be maintained between the antenna of this

device and persons during device operation. The use of any other accessories may not ensure compliance with IC RSS 102RF exposure guidelines.

Déclaration d'exposition aux radiations:

La Jetson Dev Kit a ete testee conformemment aux normes d'exposition d'emission RF de la ISED RSS 102 pour un environement non controle lors d'utilisation avec les accessoires fournis or recommendes par NVIDIA. Pour satisfaire aux exigences d'exposition IC, une distance de séparation d'au moins 20 cm doit être maintenue entre l'antenne de cet appareil et des personnes pendant le fonctionnement de l'appareil. L'utilisation d'accessoires autres que ceux recommendes par NVIDIA ne guarantis pas la compatibilite avec les normes d'emission RF de la IC RSS 102.

European Union

European Conformity; Conformité Européenne (CE)



	BE	BG	CZ	DK	DE	EE	IE	EL	ES	FR	HR
	IT	CY	LV	LT	LU	HU	MT	NL	AT	PL	PT
	RO	SI	SK	FI	SE	UK	IS	LI	NO	CH	TR

This device bears the CE mark in accordance with Directive 2014/53/EU.

This device complies with the following directives:

- Radio Equipment Directive 2014/53/EU
- RoHS Directive 2011.65.EU

The full text of the EU declaration of conformity is available at:

`https://developer.nvidia.com/embedded/support`

A copy may also be obtained directly from NVIDIA GmbH (Floessergasse 2, 81369 Munich, Germany).

These devices operate in the following frequency bands and maximum transmitted power:

Frequency Band	EIRP (dBm)	EIRP (mW)
2402 - 2480 MHz (Bluetooth)	12	16
2412 - 2472 MHz	20	100
5180 - 5320 MHz	23	200
5500 - 5700 MHz	23	200

5745 - 5825 MHz	14	25

Warning

- Operation in 5150 - 5350 MHz frequency band is restricted to indoor use.
- This equipment must be installed and operated with a minimum distance of 20 cm between the radiator and your body.
- Pulse W1043 antennas are supplied with the development kit. Only those antennas of the same Type and Gain can be used with this device.
- Any modifications to this device, not expressly approved by the manufacturer, voids the user authority to operate the equipment.

Hardware Version

- Jetson TX1: 945-82371-0005-000
- Jetson TX2: 945-82771-0005-000

Firmware Version

7.35.221.11 (WLAN); 030A0525 (Bluetooth)

Australia and New Zealand

Australian Communications and Media Authority (RCM)



This product meets the applicable EMC requirements for Class B, I.T.E equipment and applicable radio equipment requirements.

Japan

Voluntary Control Council for Interference (VCCI)



この装置は、クラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。
取扱説明書に従って正しい取り扱いをして下さい。
VCCI－B

Radio/ Telecommunications Certification

Jetson TX1



Jetson TX2



South Korea

Radio Research Agency (RRA)
Korean Agency for Technology and Standards (KATS)

Jetson TX1



MSIP-CRM-NVA-P2180
MSIP-RMM-NVA-P2597

Jetson TX2



MSIP-CRM-NVA-P3310
MSIP-RMM-NVA-P2597

B급 기기 (가정용 방송 통신기자재)	이 기기는 가정용(B급) 전자파적합기기로서 주 로 가정에서 사용하는 것을 목적으로 하며, 모 든 지역에서 사용할 수 있습니다.

Taiwan

National Communications Commission (國家通訊傳播委員會)

Jetson TX1



CCAJ15LP6160T6

Jetson TX2



CCAJ17LP1260T1

注意！

依據 低功率電波輻射性電機管理辦法

第十二條

經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

第十四條

低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。

前項合法通信，指依電信法規定作業之無線電通信。

低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

模組認證合格標簽（ID）：

“Jetson TX1（ CCAJ15LP6160T6），Jetson TX2（ CCAJ17LP1260T1）”

如果使用本模組之平台，無法在外部看見審驗合格標籤時，應在該

平台的外部明顯標示

“內含射頻模組 Jetson TX1（ CCAJ15LP6160T6），Jetson TX2（ CCAJ17LP1260T1）

應避免影響附近雷達系統之操作。

高增益指向性天線只得應用於固定式點對點系統。

電磁波曝露量MPE標準值1mW/cm²，送測產品實測值為：.109 mW/cm².

China

State Radio Regulations Committee

Jetson TX1:

- CMIIT ID: 2015AJ7078
- 本□□包含型号核准代□□CMIIT ID: 2015AJ6648(M) 的无□□□射模□

Jetson TX2:

- CMIIT ID: 2015AJ7078
- 本□□包含型号核准代□□CMIIT ID: 2017AJ1049(M) 的无□□□射模□

Singapore

Info-Communications Development Authority of Singapore

Complies with
IDA Standards
DA00006A

Environmental Disclosures

California Prop 65 Warning – California law requires this warning to be provided to California customers.

Prop 65 Warning: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

China RoHS Material Content Declaration



产品中有害物质的名称及含量
The Table of Hazardous Substances and their Content
根据中国《电器电子产品有害物质限制使用管理办法》
as required by Management Methods for Restricted Use of Hazardous Substances in Electrical and Electronic Products

部件名称 Parts	有害物质 Hazardous Substances					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷□路部件 PCA	X	O	O	O	O	O
□理器 Processor	O	O	O	O	O	O
存□□□ System memory	X	O	O	O	O	O
□源□□ Power supply	X	O	O	O	O	O
□像□ Camera module	X	O	O	O	O	O
天□ Antenna	X	O	O	O	O	O
机械部件 Mechanicals	X	O	O	O	O	O
□材/□接器 Cables/Connectors	X	O	O	O	O	O
□接金属 Soldering material	O	O	O	O	O	O
助□□，□膏，□□及耗材 Flux, Solder Paste, label and other consumable materials	O	O	O	O	O	O

本表格依据SJ/T 11364-2014 的□定□制

The table according to SJ/T 11364-2014

O：表示□有害物□在□部件所有均□材料中的含量均在GB/T 26572-2011 □准□定的限量要求以下。

O: Indicates that this hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in GB/T 26572-2011.

X：表示□有害物□至少在□部件的某一均□材料中的含量超出GB/T 26572-2011 □准□定的限量要求。

X: Indicates that this hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in GB/T 26572-2011.

此表中所有名称中含 “X” 的部件均符合欧盟 RoHS 立法。

All parts named in this table with an “X” are in compliance with the European Union’s RoHS Legislation.

注：□保使用期限的参考□□取决于□品正常工作的温度和湿度等条件

Note: The referenced Environmental Protection Use Period Marking was determined according to normal operating use conditions of the product such as temperature and humidity.

Taiwan RoHS Material Content Declaration

限用物質含有情況標示聲明書 Declaration of the presence condition of the Restricted Substances Marking						
設備名稱：Jetson TX2 Developer Kit Equipment Name: Jetson TX2 Developer Kit						
單元 Parts	限用物質及其化學符號 Restricted substances and its chemical symbols					
	□ (Pb)	汞 (Hg)	□ (Cd)	六價□ (Cr(VI))	多溴聯苯 (PBB)	多溴二苯□ (PBDE)
印刷電路部件 PCA	-	O	O	O	O	O
處理器 Processor	O	O	O	O	O	O
存儲設備 System memory	-	O	O	O	O	O
電源設備 Power adapter	-	O	O	O	O	O
攝像頭 Camera module	-	O	O	O	O	O
天線 Antenna	-	O	O	O	O	O
機械部件 Mechanicals	-	O	O	O	O	O
線材/連接器 Cables/Connectors	-	O	O	O	O	O
□接金屬 Soldering material	O	O	O	O	O	O
助□劑，錫膏，標籤及耗材 Flux, Solder Paste, label and other consumable materials	O	O	O	O	O	O

備考1：O：系指該限用物質未超出百分比含量基準□

Note 1： O：indicates that the percentage content of the restricted substance does not exceed the percentage of reference value of presence.

備考2： -：系指該□限用物質□排外□目。

Note 2：-：indicates that the restricted substance corresponds to the exemption.

此表中所有名稱中含 “-” 的部件均符合歐盟 RoHS 立法。

All parts named in this table with an “-” are in compliance with the European Union’s RoHS Legislation.

注：環保使用期限的參考標識取决與□品正常工作的温度和濕度等條件 Note: The referenced Environmental Protection Use Period Marking was determined according to normal operating use conditions of the product such as temperature and humidity.

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