JetPack-6.x Installation for ADL-AI2500

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WHAT YOU WILL LEARN	ENVIRONMENT
Include the kernel files in the Jetson OS image; install Jetson OS; install Jetson SDK components.	Hardware: ADL-AI2500 with 2TB NVME SSD Host OS: Ubuntu 22.04 LTS
COMPATIBLE MODULES	**RECOMMENDED WORKFLOW**
Jetson Orin NX and Jetson Orin Nano modules. Only the BSP archive changes by module.	Build the OS image first, apply the BSP files, flash the device, then install the runtime / SDK components.

1. Overview

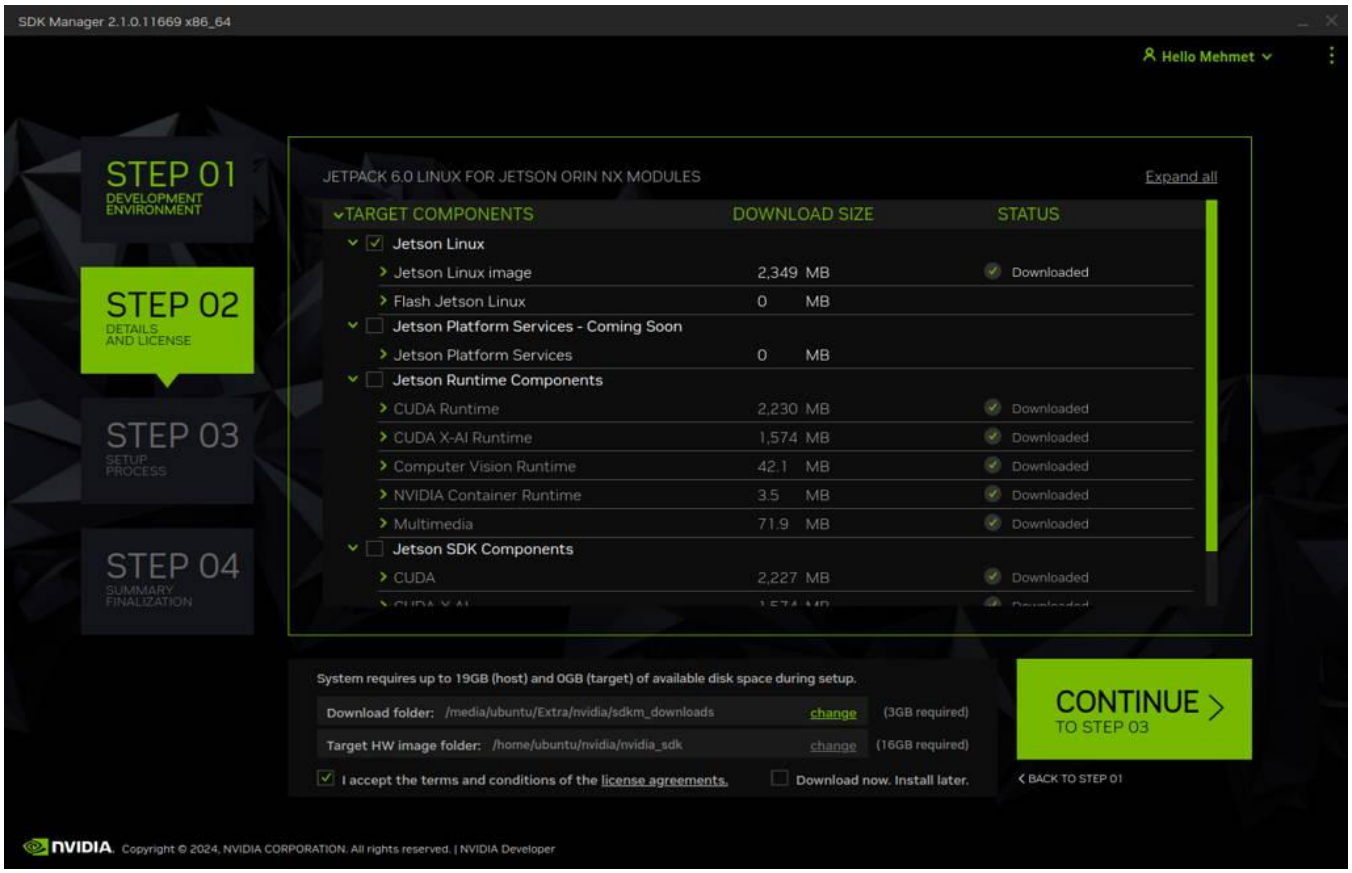
This guide walks through the ADL-AI2500 **JetPack 6.x setup in three phases:** prepare the Jetson OS image with the correct BSP files, flash the Jetson OS to the target device, and install the runtime / SDK components over Ethernet.

2. Prepare the Jetson OS image

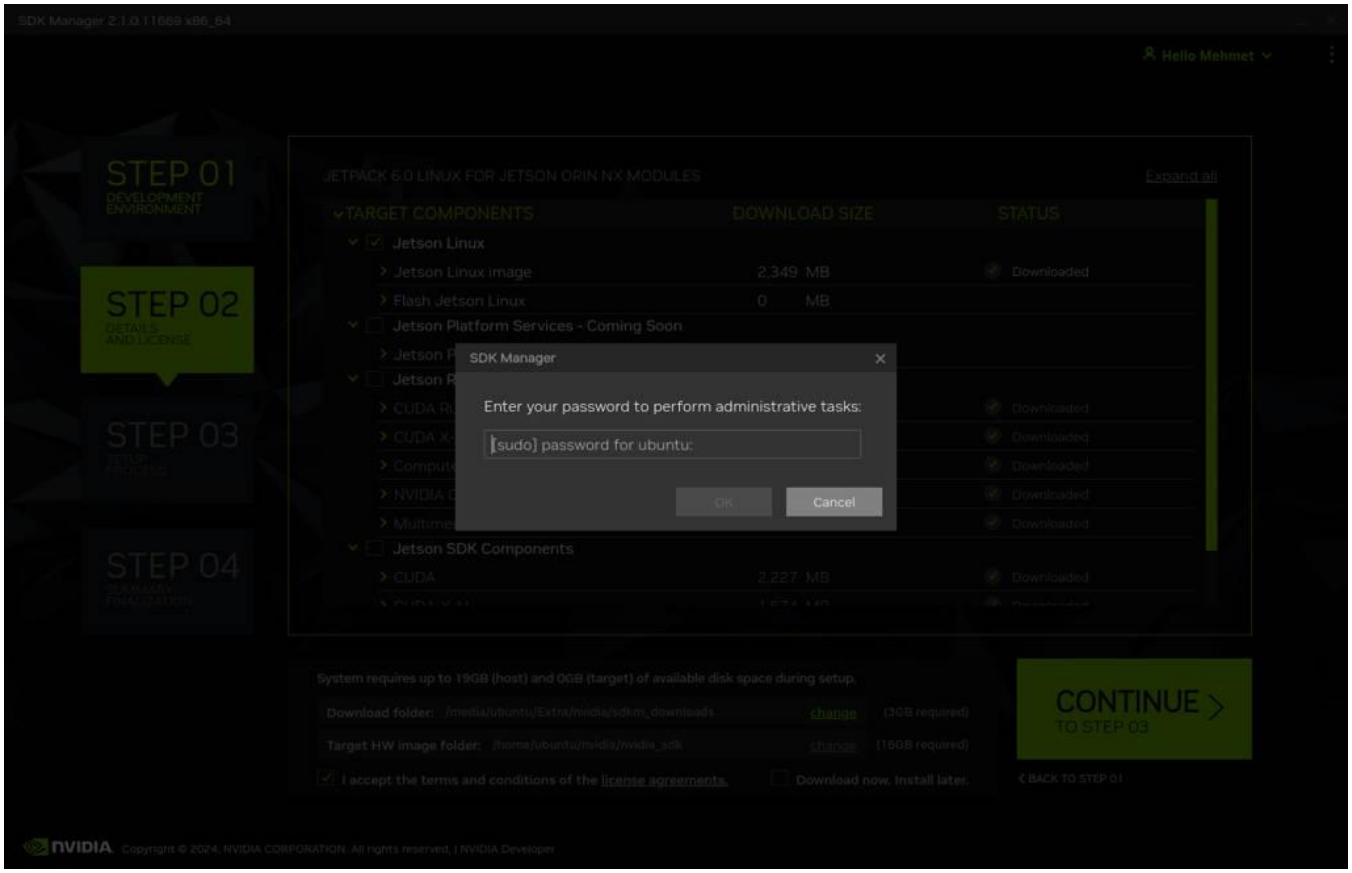
Open NVIDIA SDK Manager and select the correct JetPack version and target module (Jetson Orin Nano modules or Jetson Orin NX modules). Host Machine components are not required.

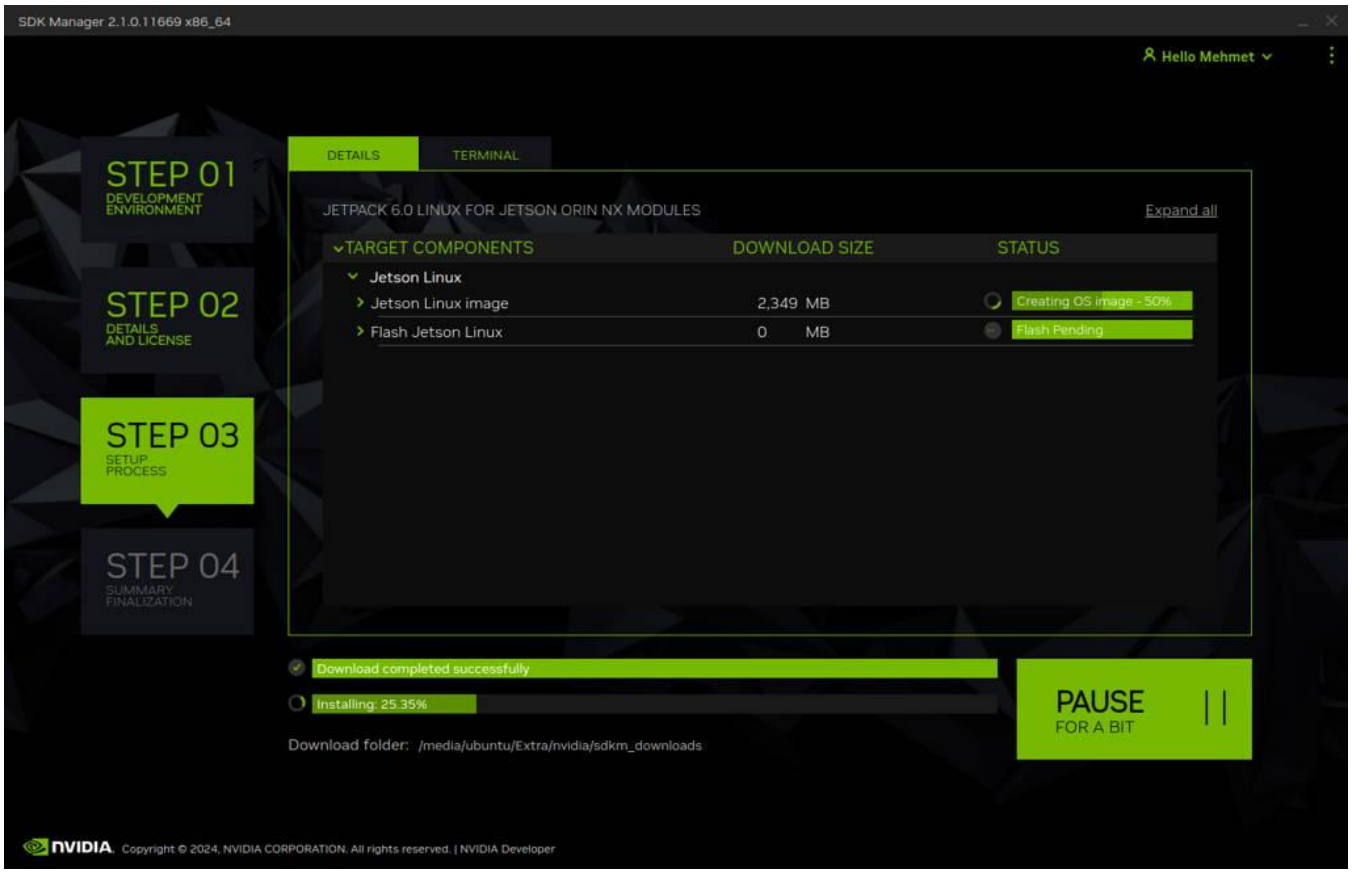
Continue to Step 2..

Select only Jetson Linux, accept the terms and conditions, and continue to Step 3.

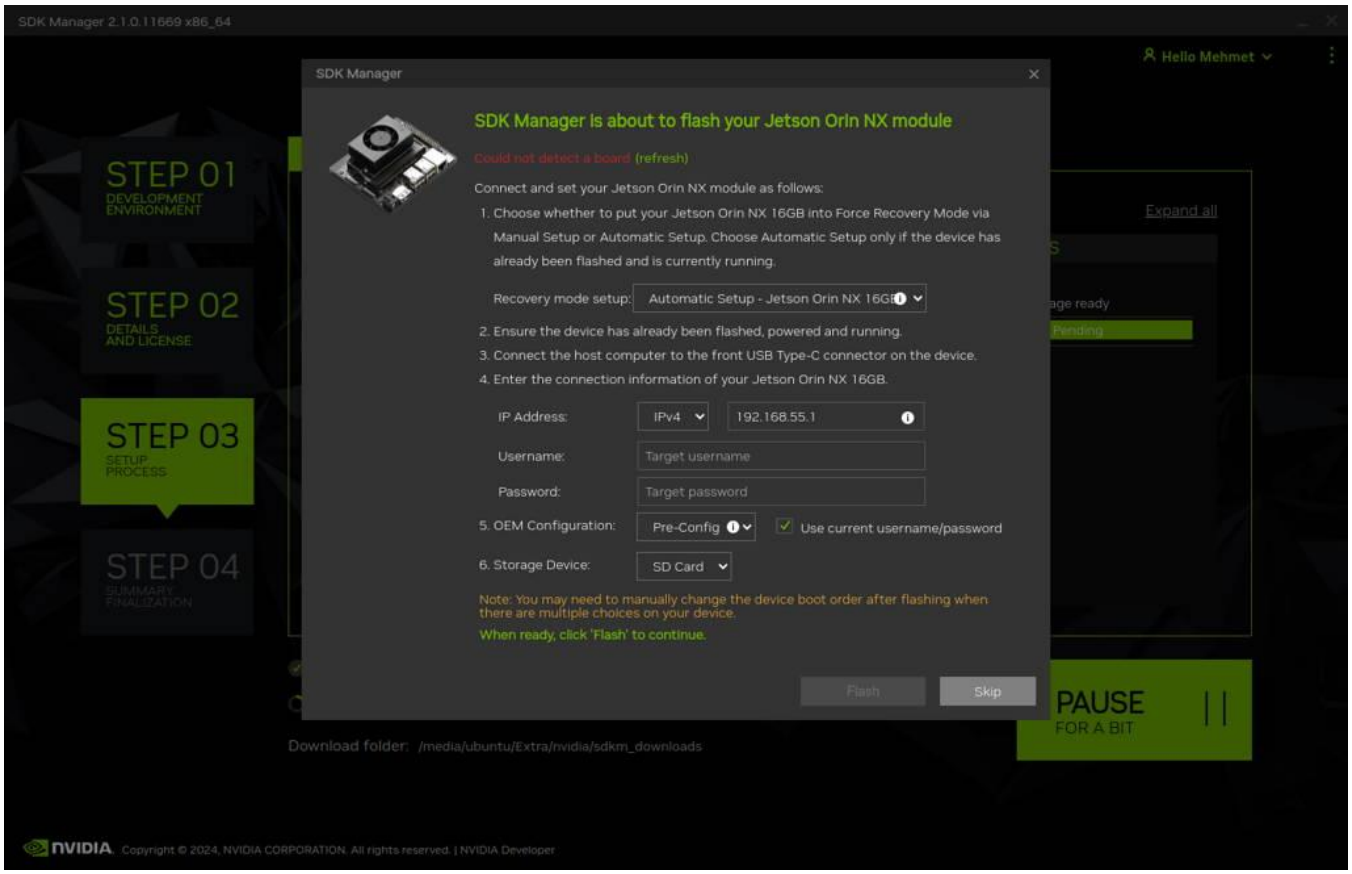


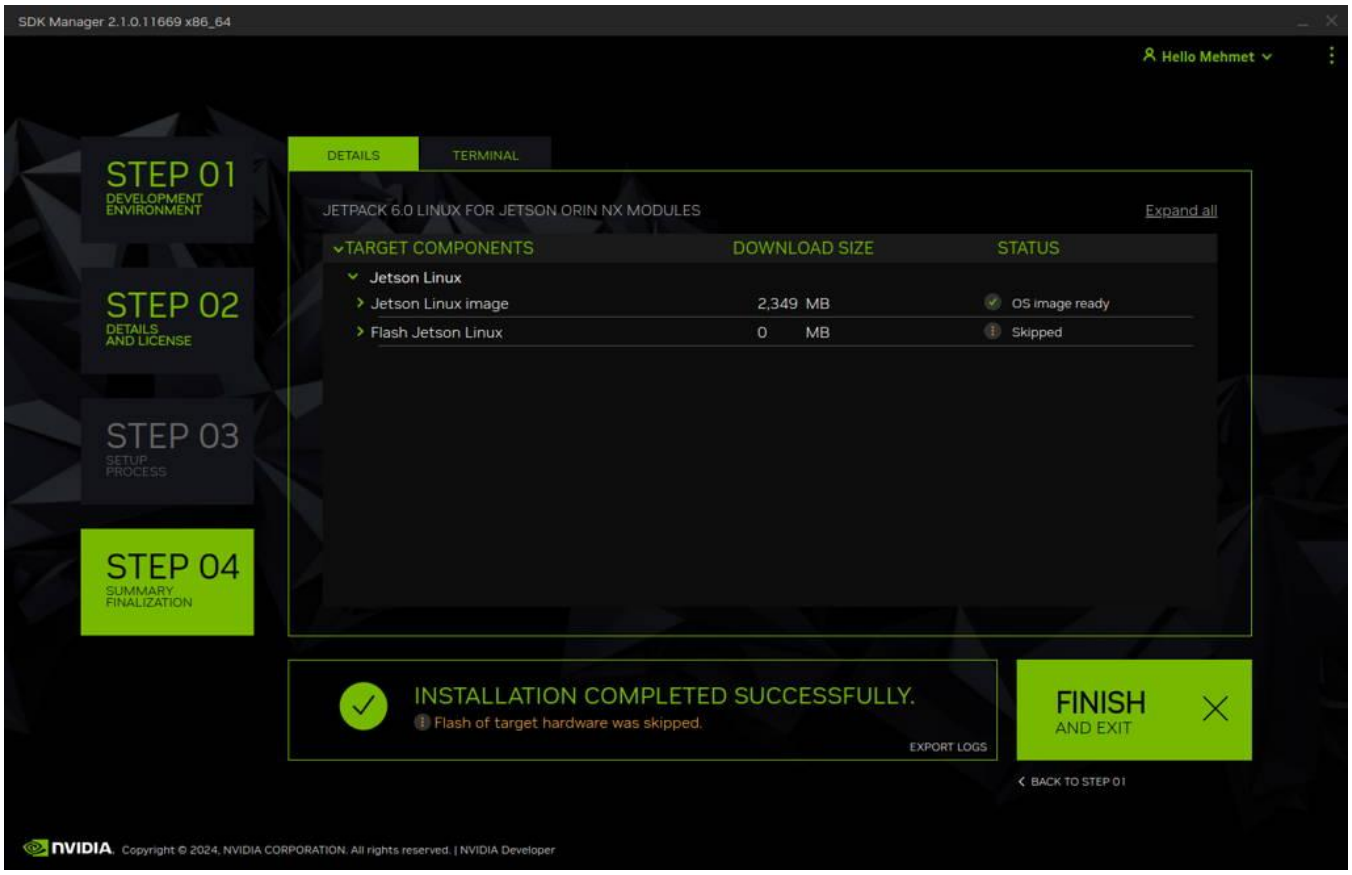
When SDK Manager asks for the Linux username password, enter it and continue.





Let SDK Manager build the Jetson OS image. When it later asks about flashing style, skip that step and exit SDK Manager.

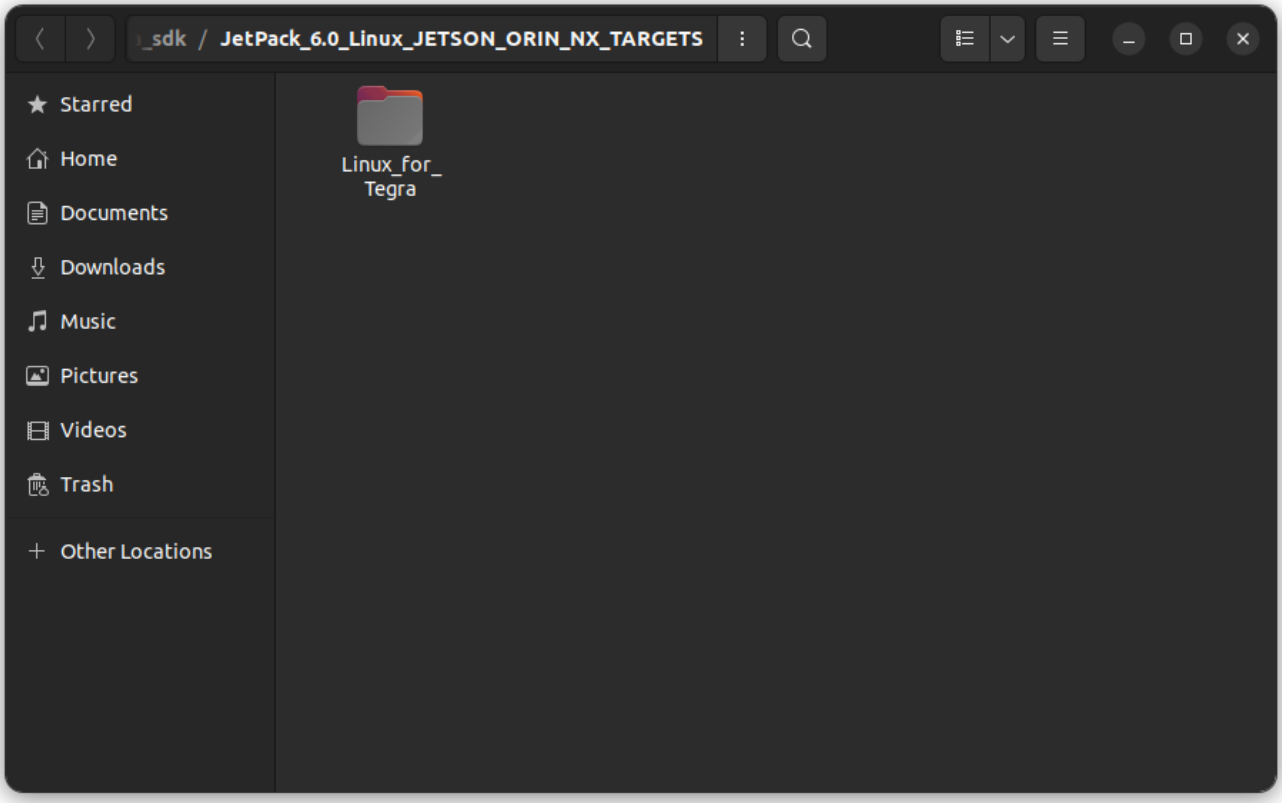




Target image folder locations

Open the target HW image folder.

JetPack	Orin NX	Orin Nano
6.0	~/nvidia/nvidia_sdk/JetPack_6.0_Linux_JETSON_ORIN_NX_TARGETS/	~/nvidia/nvidia_sdk/JetPack_6.0_Linux_JETSON_ORIN_NANO_TARGETS/
6.1	~/nvidia/nvidia_sdk/JetPack_6.1_Linux_JETSON_ORIN_NX_TARGETS/	~/nvidia/nvidia_sdk/JetPack_6.1_Linux_JETSON_ORIN_NANO_TARGETS/
6.2	~/nvidia/nvidia_sdk/JetPack_6.2_Linux_JETSON_ORIN_NX_TARGETS/	~/nvidia/nvidia_sdk/JetPack_6.2_Linux_JETSON_ORIN_NANO_TARGETS/
6.2.1	~/nvidia/nvidia_sdk/JetPack_6.2.1_Linux_JETSON_ORIN_NX_TARGETS/	~/nvidia/nvidia_sdk/JetPack_6.2.1_Linux_JETSON_ORIN_NANO_TARGETS/



Target HW image folder

Download and apply the BSP files

Download the matching BSP archive for your JetPack version and module type, extract it, then copy the extracted files into the target HW image folder. The remaining steps are the same across module types; only the BSP archive differs.

For NX:

For JetPack – 6.0 Orin NX BSP Files

For JetPack – 6.1 Orin NX BSP Files

For JetPack – 6.2 Orin NX BSP Files

For JetPack – 6.2.1 Orin NX BSP Files

For Nano:

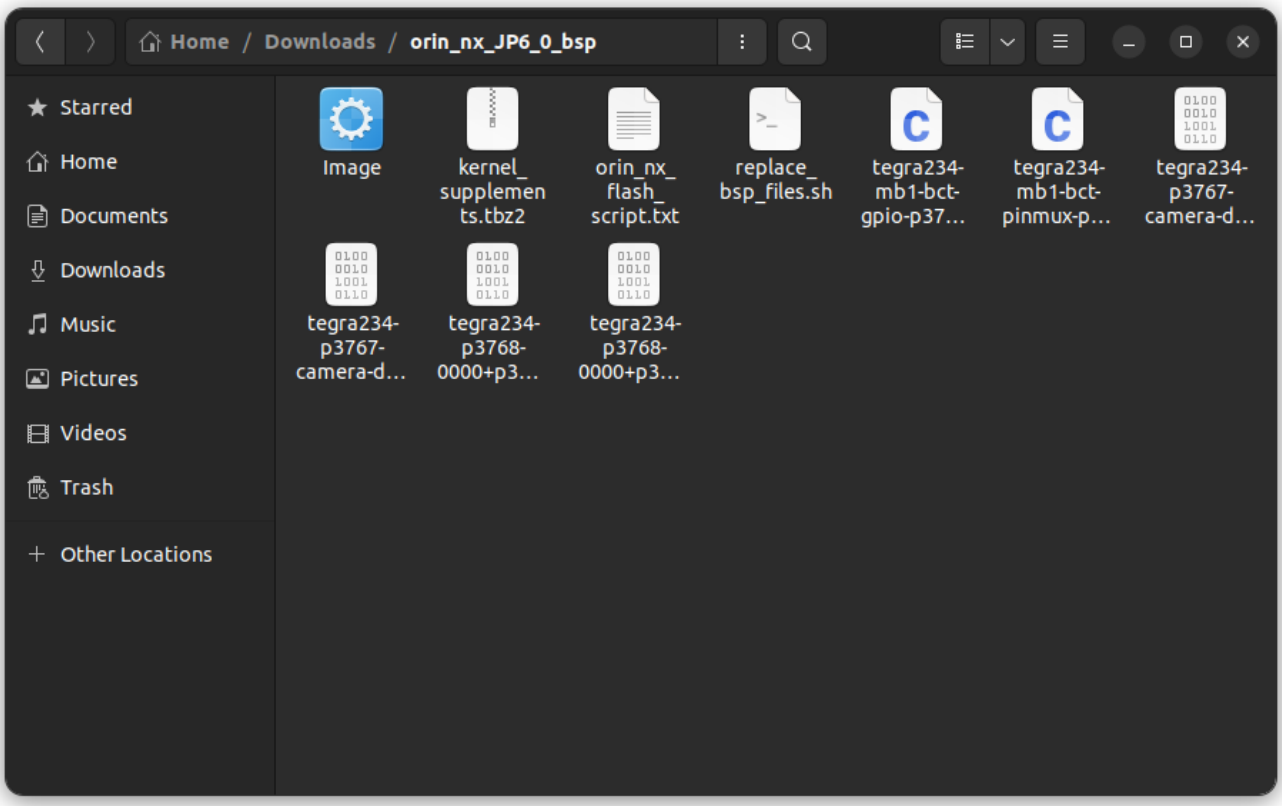
For JetPack – 6.0 Orin Nano BSP Files

For JetPack – 6.1 Orin Nano BSP Files

For JetPack – 6.2 Orin Nano BSP Files

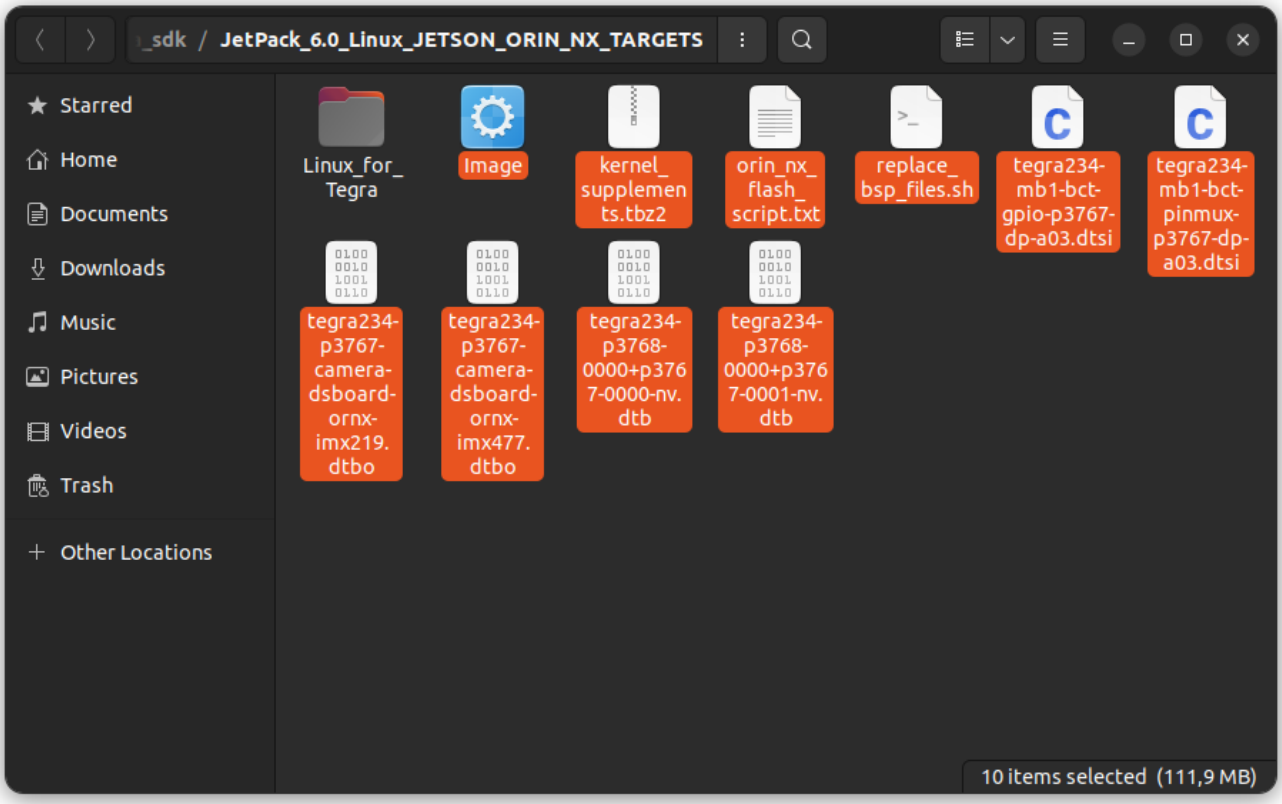
For JetPack – 6.2.1 Orin Nano BSP Files

*Note: **Hint:** The following steps are for the Orin NX, but they are the same for the other Jetson module types (only the BSP files are different).*



Example BSP package extracted files

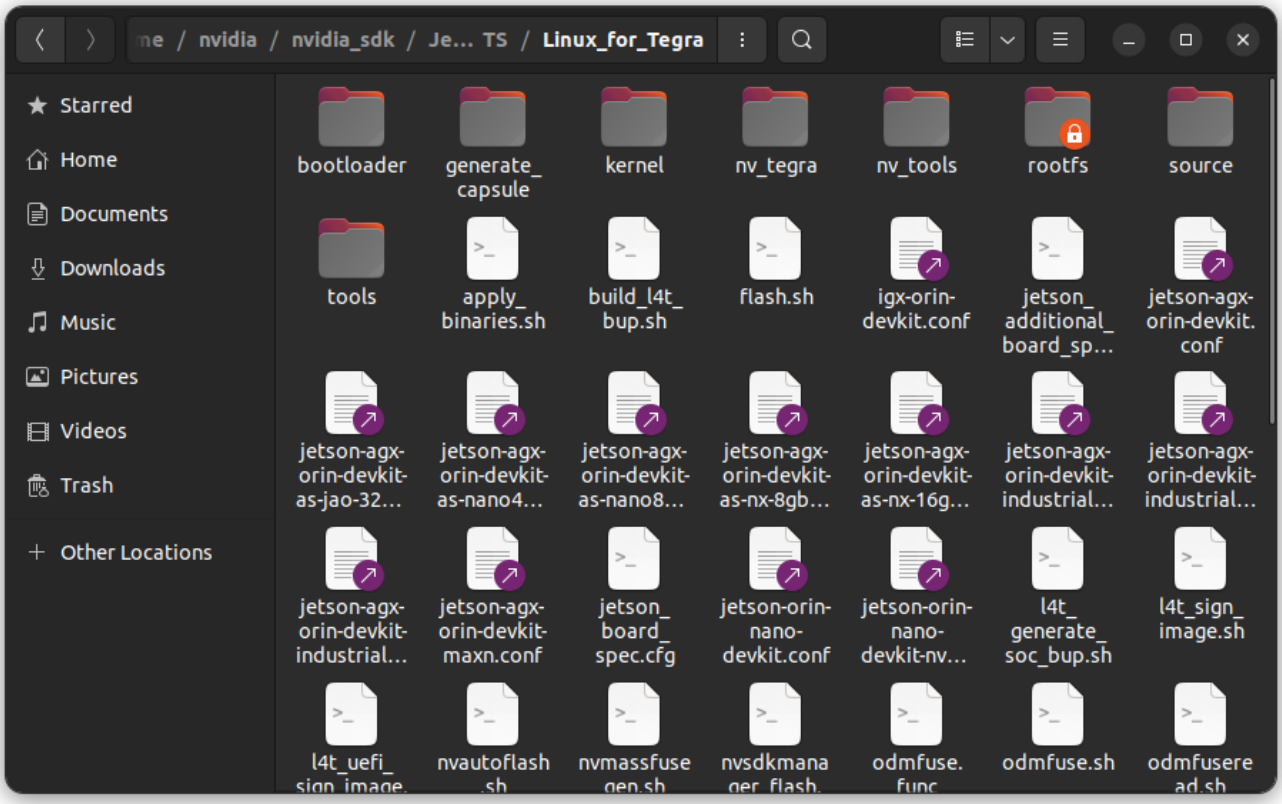
Copy all files to the target HW image folder.



Example BSP package copied to the target image folder

Create the system binaries

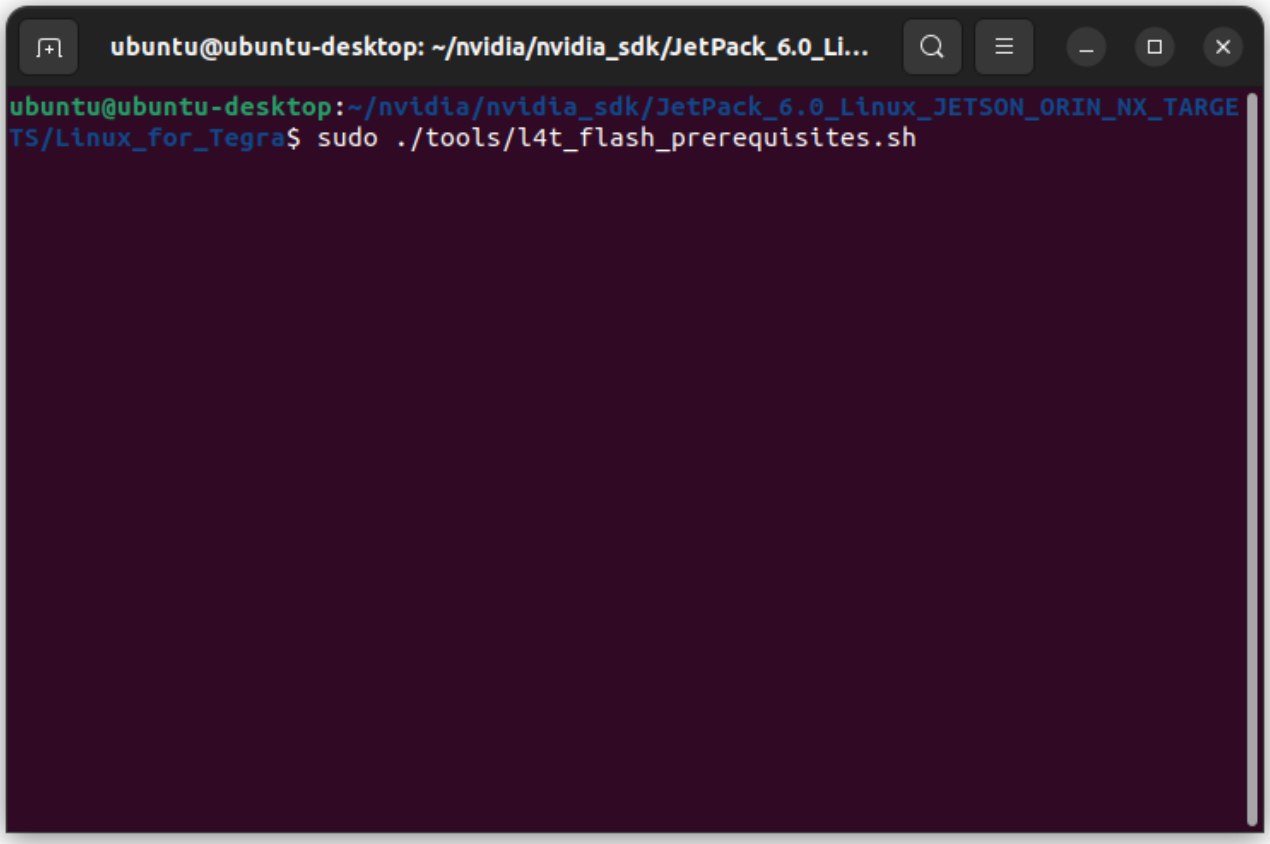
Open a terminal in the “Linux_for_Tegra” folder.

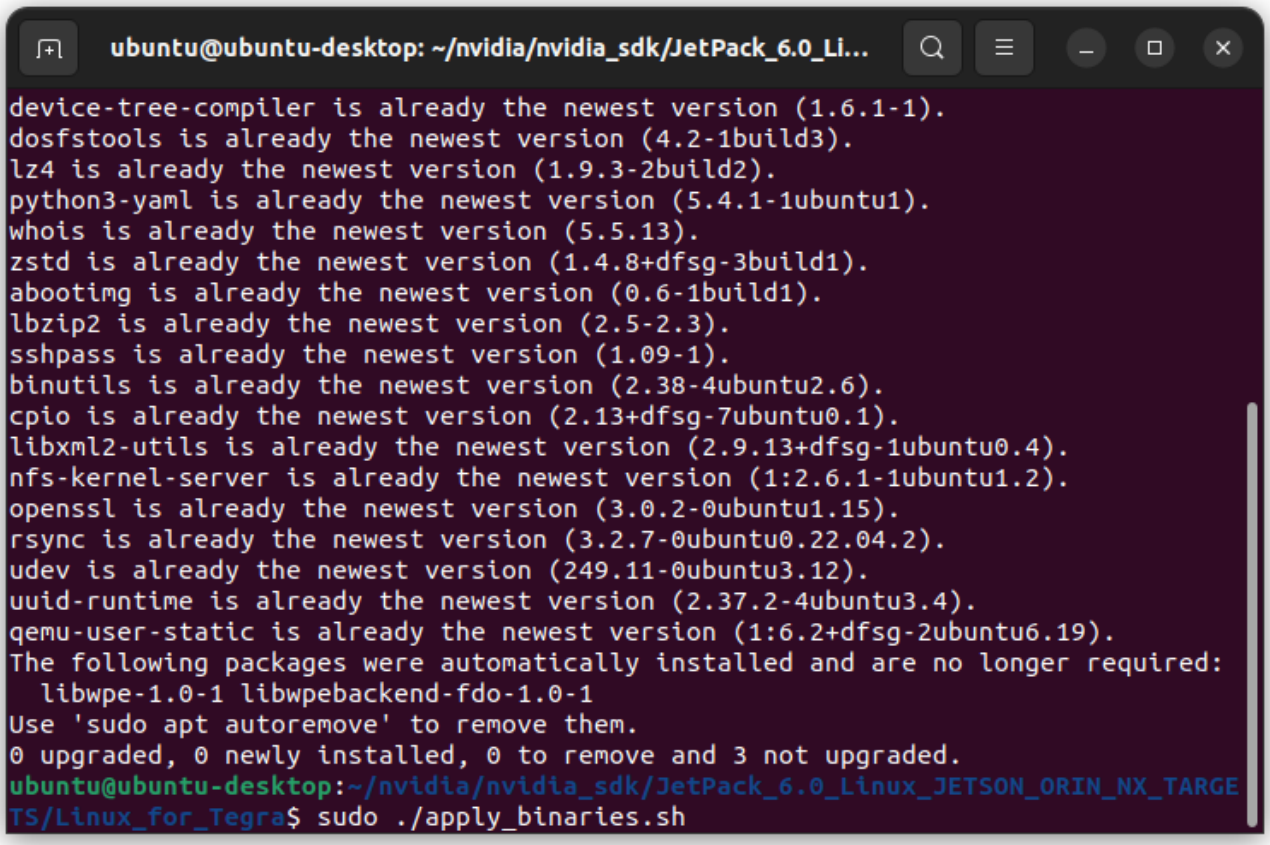


Linux_for_Tegra folder

Create the system binaries and apply the NVIDIA binaries.

```
sudo ./tools/l4t_flash_prerequisites.sh
sudo ./apply_binaries.sh
```

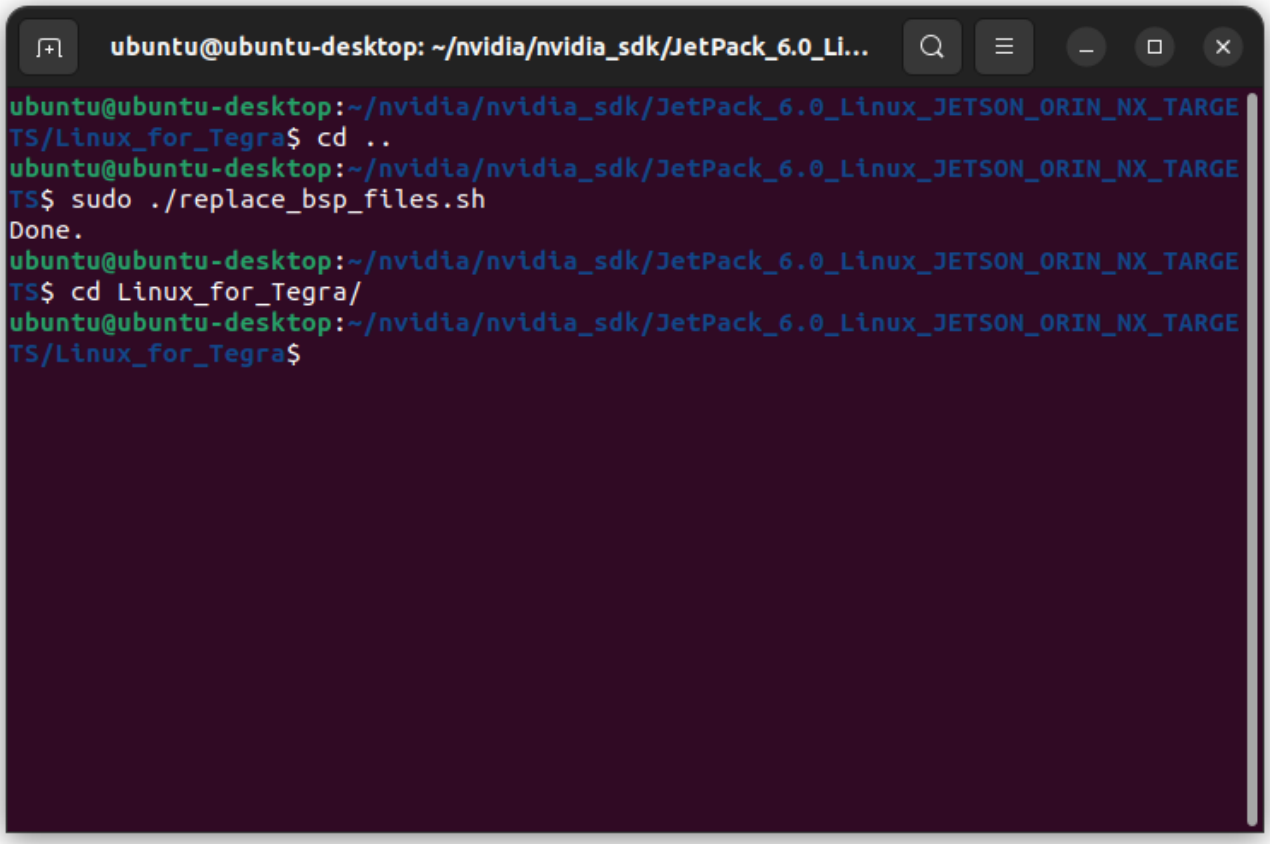

ubuntu@ubuntu-desktop: ~/nvidia/nvidia_sdk/JetPack_6.0_Li...
ubuntu@ubuntu-desktop:~/nvidia/nvidia_sdk/JetPack_6.0_Linux_JETSON_ORIN_NX_TARGETS/Linux_for_Tegra$ sudo ./tools/l4t_flash_prerequisites.sh


ubuntu@ubuntu-desktop: ~/nvidia/nvidia_sdk/JetPack_6.0_Li...
device-tree-compiler is already the newest version (1.6.1-1).
dosfstools is already the newest version (4.2-1build3).
lz4 is already the newest version (1.9.3-2build2).
python3-yaml is already the newest version (5.4.1-1ubuntu1).
whois is already the newest version (5.5.13).
zstd is already the newest version (1.4.8+dfsg-3build1).
abootimg is already the newest version (0.6-1build1).
lbzip2 is already the newest version (2.5-2.3).
sshpass is already the newest version (1.09-1).
binutils is already the newest version (2.38-4ubuntu2.6).
cpio is already the newest version (2.13+dfsg-7ubuntu0.1).
libxml2-utils is already the newest version (2.9.13+dfsg-1ubuntu0.4).
nfs-kernel-server is already the newest version (1:2.6.1-1ubuntu1.2).
openssl is already the newest version (3.0.2-0ubuntu1.15).
rsync is already the newest version (3.2.7-0ubuntu0.22.04.2).
udev is already the newest version (249.11-0ubuntu3.12).
uuid-runtime is already the newest version (2.37.2-4ubuntu3.4).
qemu-user-static is already the newest version (1:6.2+dfsg-2ubuntu6.19).
The following packages were automatically installed and are no longer required:
libwpe-1.0-1 libwpebackend-fdo-1.0-1
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 3 not upgraded.
ubuntu@ubuntu-desktop:~/nvidia/nvidia_sdk/JetPack_6.0_Linux_JETSON_ORIN_NX_TARGETS/Linux_for_Tegra$ sudo ./apply_binaries.sh

Apply the New BSP files and interface configuration

Move up one level, run the BSP replacement script, then return to Linux_for_Tegra.

```
cd ..
sudo ./replace_bsp_files.sh
cd Linux_for_Tegra/
```



Optional: create a default user before first boot

If you want to bypass the Ubuntu first-boot wizard, create the username, password, and hostname in advance with the command below:

```
sudo tools/l4t_create_default_user.sh -u {USERNAME} -p {PASSWORD} -a -n {HOSTNAME} --accept-license

Example:
sudo tools/l4t_create_default_user.sh -u ADL -p ADL -a -n ADL-desktop --accept-license
```

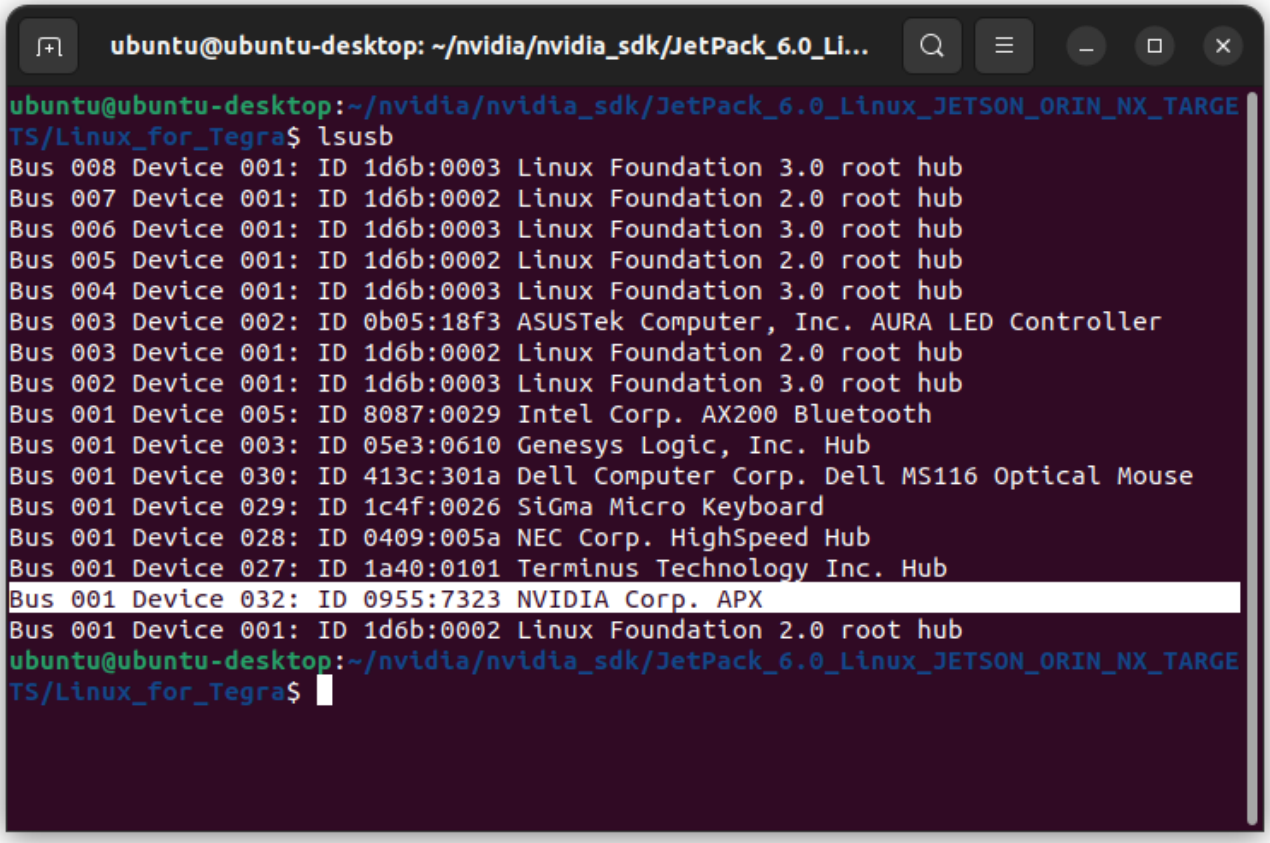
3. Flash Jetson OS to the ADL-AI2500

1. Connect the recovery USB between the installer PC and the ADL-AI2500 recovery USB, then connect power.
2. With power connected, press Reset and Recovery together, release Reset, then release Recovery about 3 seconds later to enter Recovery mode.

Attention: for the most stable USB connection, do not flash through a USB hub or docking station. Connect the Jetson directly to the host PC.

3. Run lsusb and confirm the board is detected in Recovery mode.

Device ID	Module
0955:7323	Orin NX 16GB
0955:7423	Orin NX 8GB
0955:7523	Orin Nano 8GB
0955:7623	Orin Nano 4GB



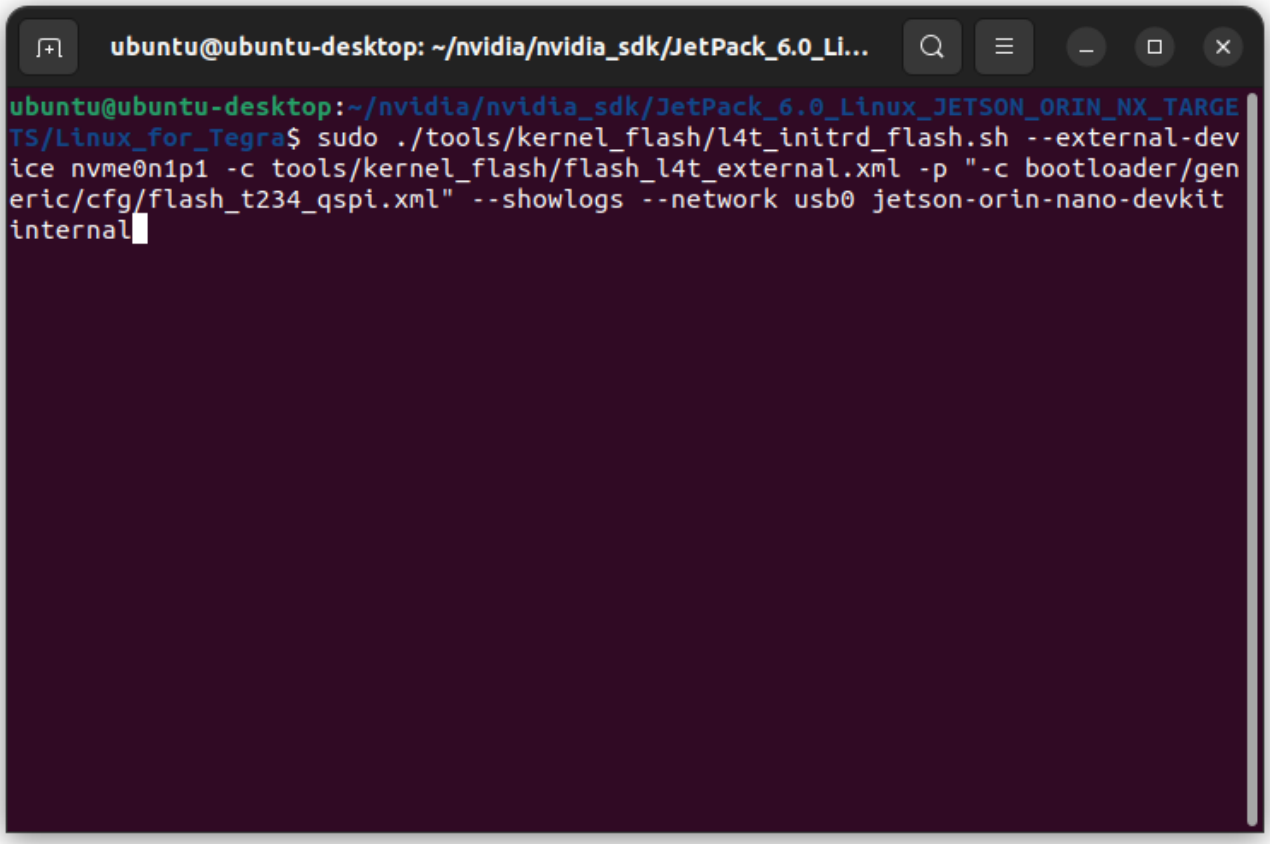
Verify Recovery mode with lsusb

4. Flash the OS to the NVMe drive with the standard command below (To flash it with Super Configuration – Skip to next Step).

```
sudo ./tools/kernel_flash/l4t_initrd_flash.sh --external-device nvme0n1p1 -c
tools/kernel_flash/flash_l4t_external.xml -p "-c bootloader/generic/cfg/flash_t234_qspi.xml" --
showlogs --network usb0 jetson-orin-nano-devkit internal
```

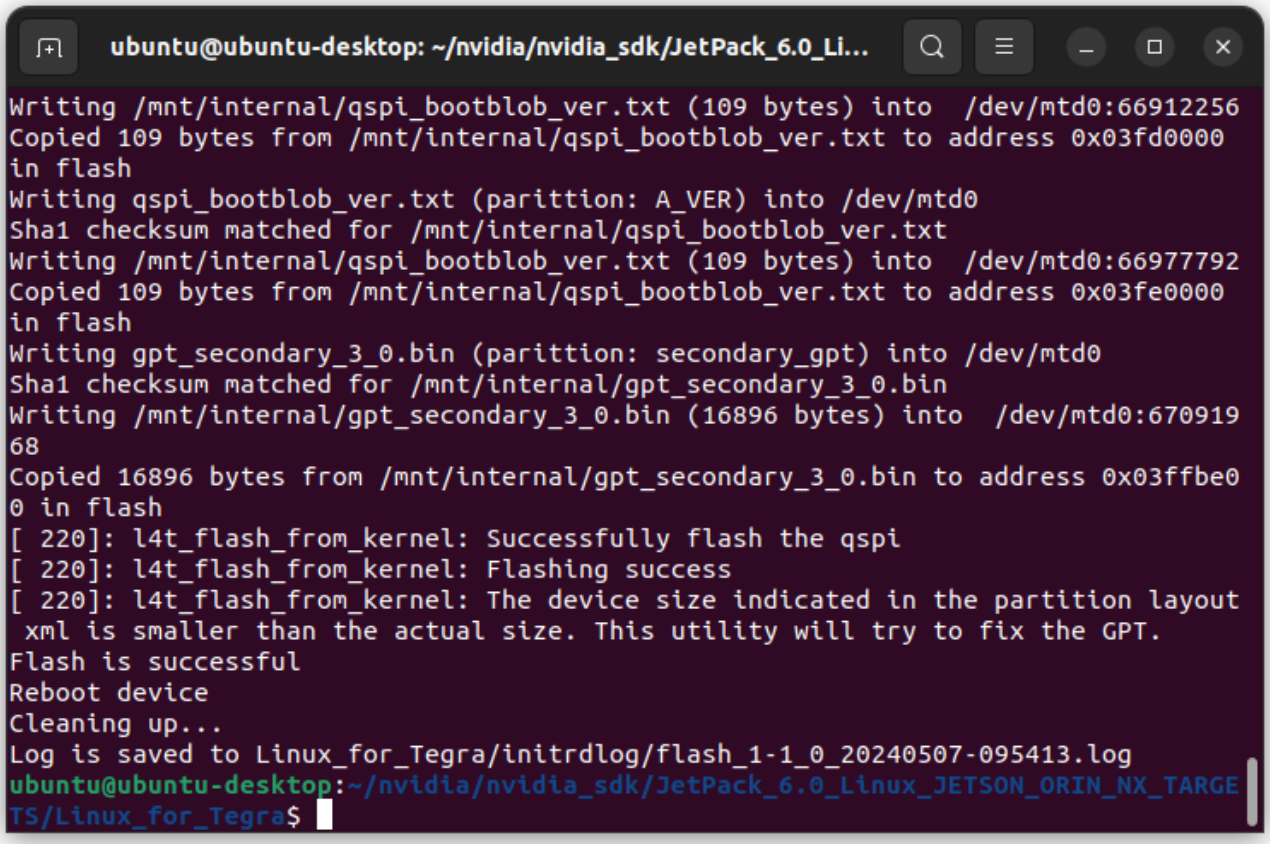
5. If you want to flash with Super Configuration (supported since JetPack 6.2), use the Super command instead.

```
sudo ./tools/kernel_flash/l4t_initrd_flash.sh --external-device nvme0n1p1 -c
tools/kernel_flash/flash_l4t_external.xml -p "-c bootloader/generic/cfg/flash_t234_qspi.xml" --
showlogs --network usb0 jetson-orin-nano-devkit-super internal
```



Example flashing command

When the script finishes, the device reboots. If you did not create a default user earlier, complete the Ubuntu installation wizard on the ADL-AI2500 (language, keyboard layout, location, username, and password).

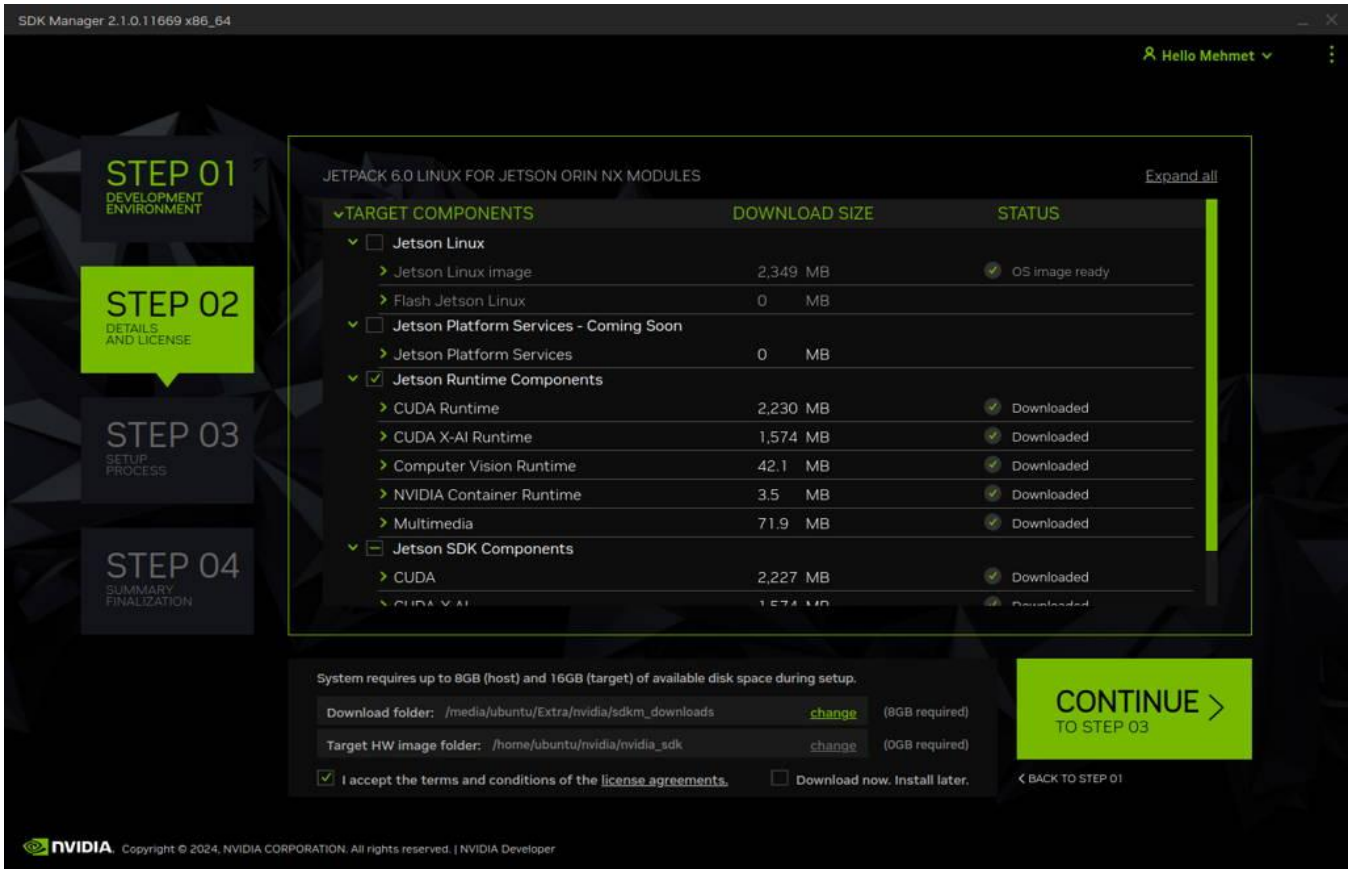


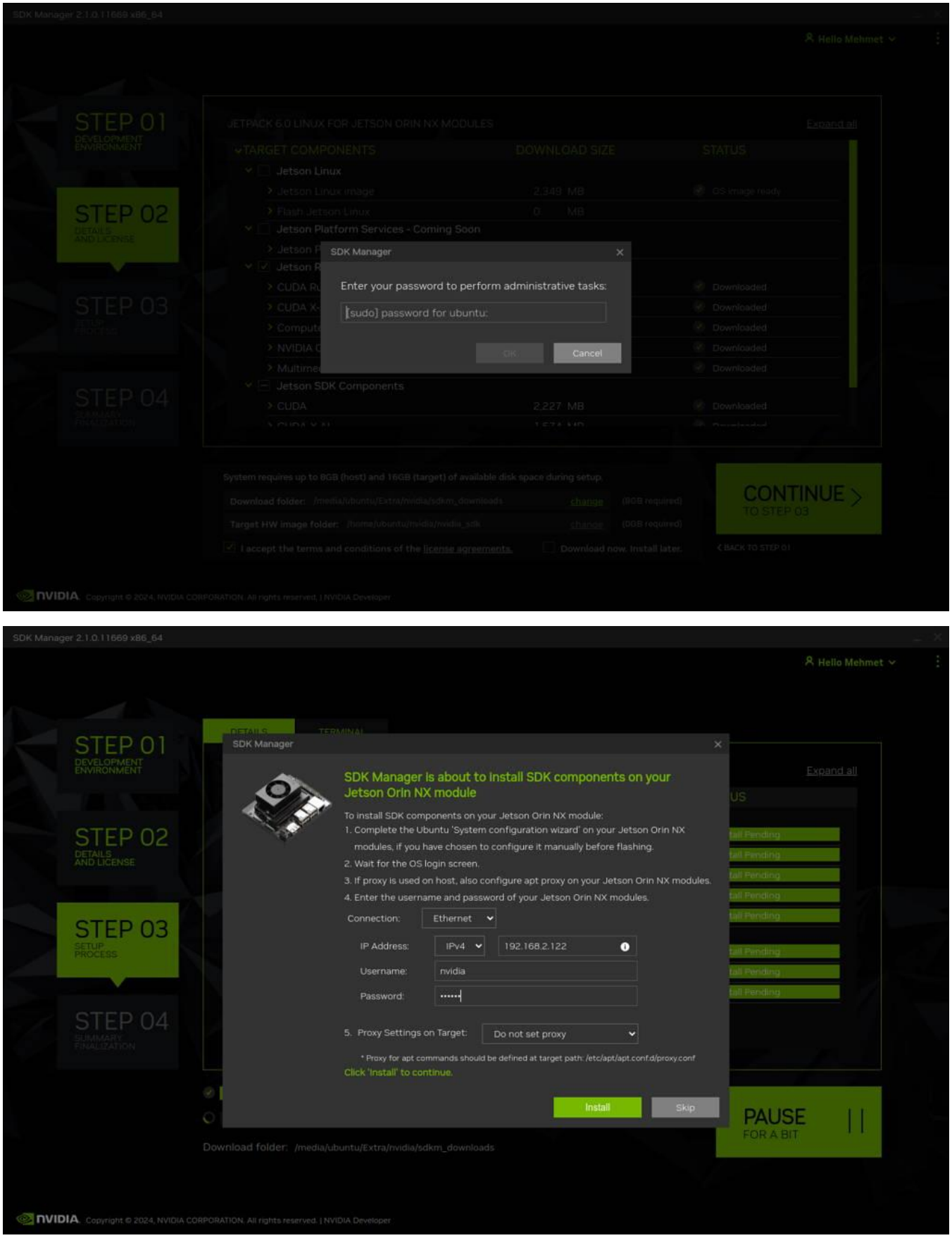
End of the flashing process

4. Install Jetson SDK components

1. Connect the ADL-AI2500 to Ethernet (or use the Recovery USB).
2. Open NVIDIA SDK Manager again and select the correct JetPack version and target module. Host Machine components are still not required. Additional SDKs such as DeepStream are optional.
3. In Step 2, select at least Jetson Runtime Components. Jetson SDK Components are optional depending on the application.
4. Enter the Linux host password when prompted.
5. Provide the ADL-AI2500 IP address (if using Ethernet), username, and password, then install the selected components.

Select the Jetson Runtime Components





Enter target credentials and install the runtime / SDK components

At the end of the installation, the ADL-AI2500 is ready to use.

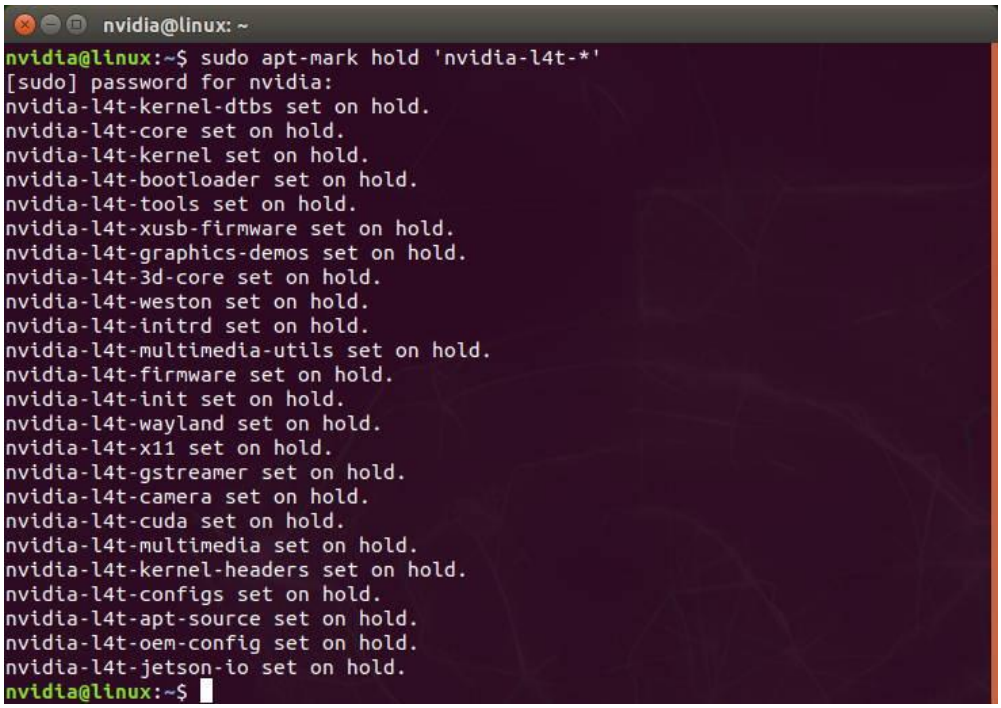
5. Final note

To avoid unwanted kernel updates from "apt upgrade" or "apt-get upgrade", follow this Jetson module guide:

Holding the L4T Packages

Open a terminal and type this command below:

```
sudo apt-mark hold 'nvidia-l4t-*'
```

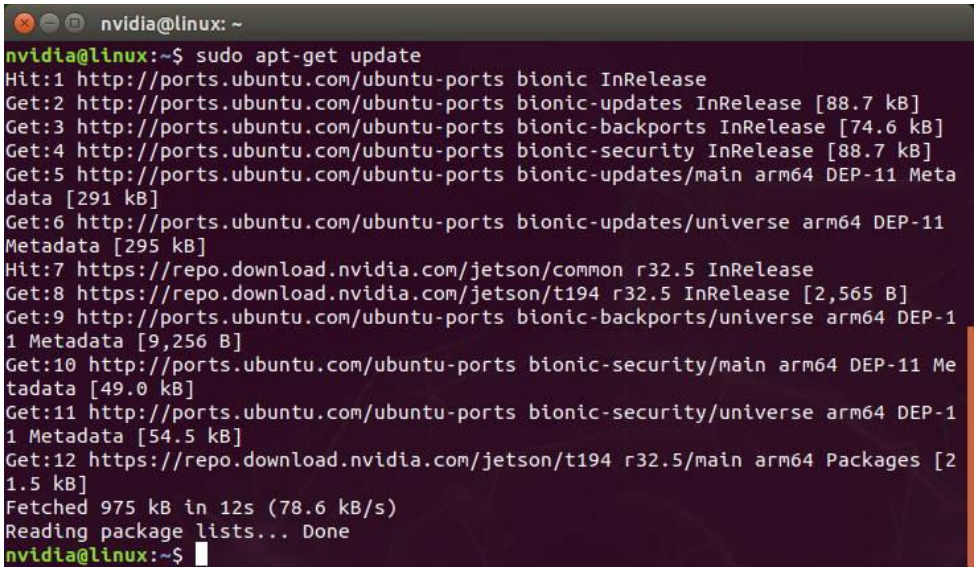


All “nvidia-l4t-*” packages set on hold.

Upgrading All Packages Without L4T

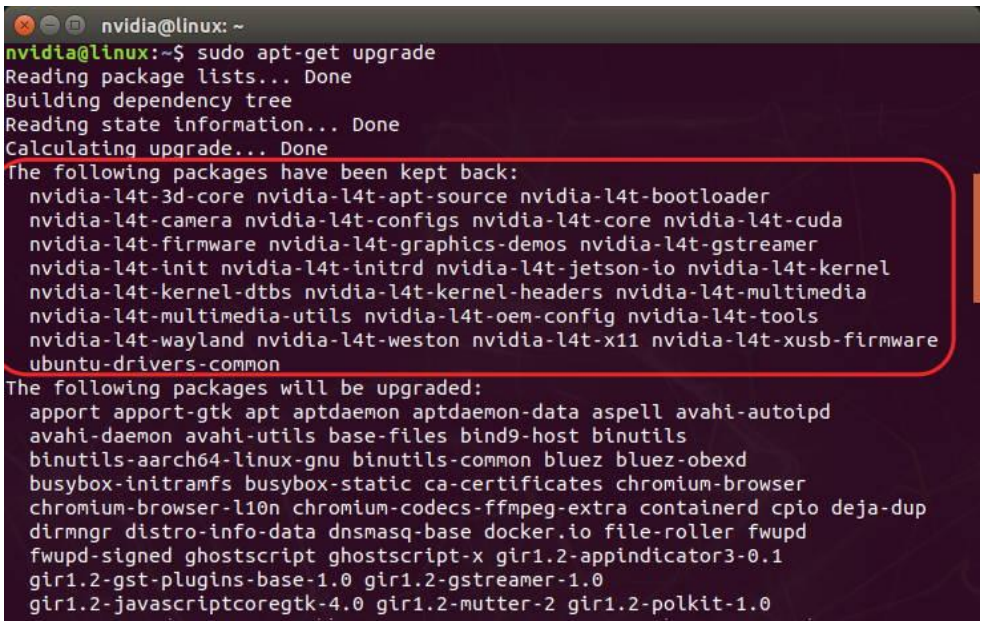
To check the updates on all packages, type this command on terminal:

```
sudo apt-get update
```



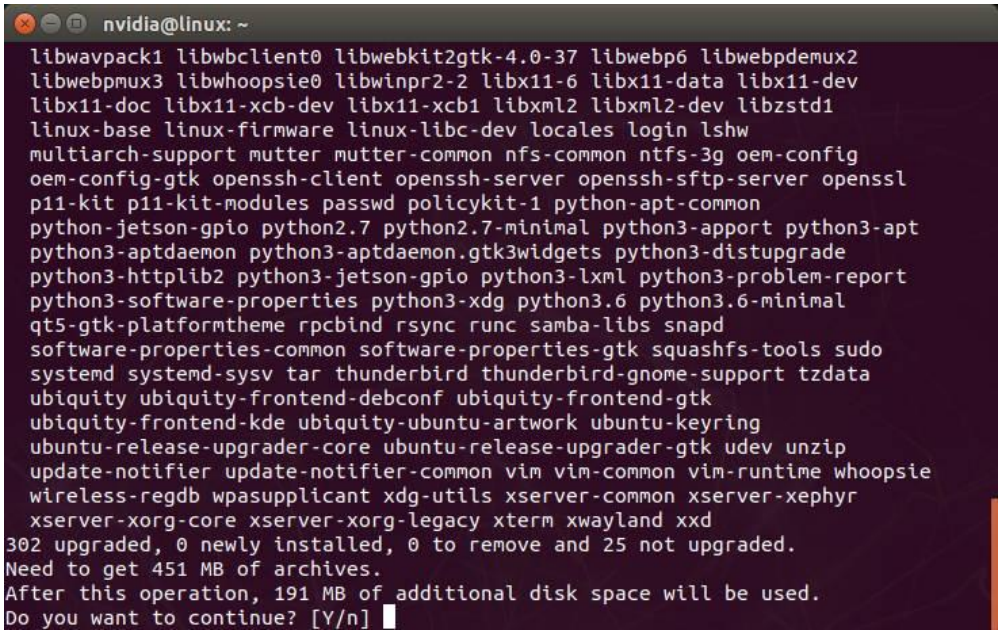
Then, you can try to upgrade them:

```
sudo apt-get upgrade
```

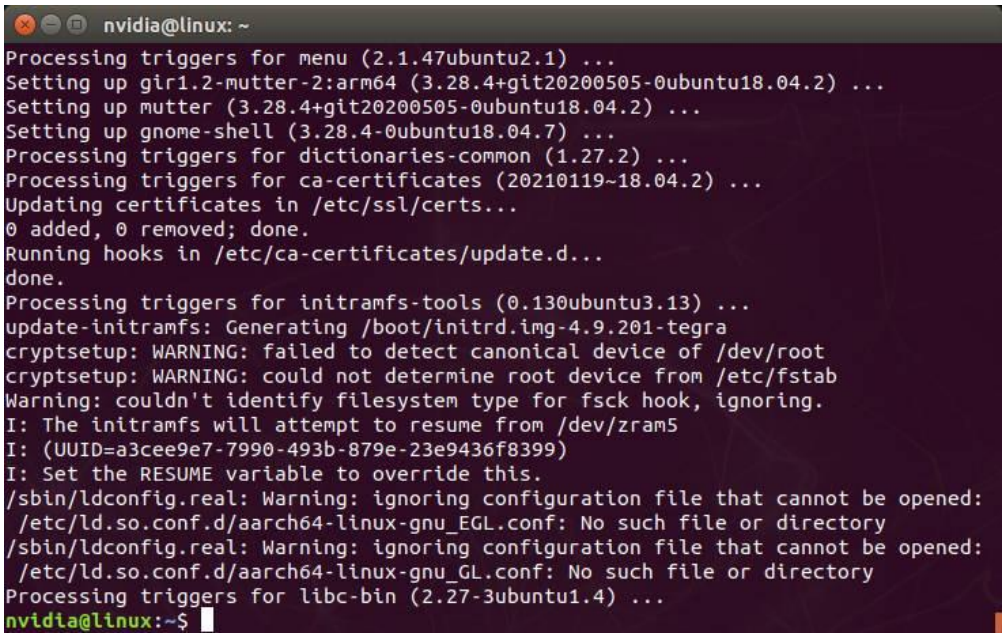


At the beginning of this command, it can be seen that all hold packages will keep back.

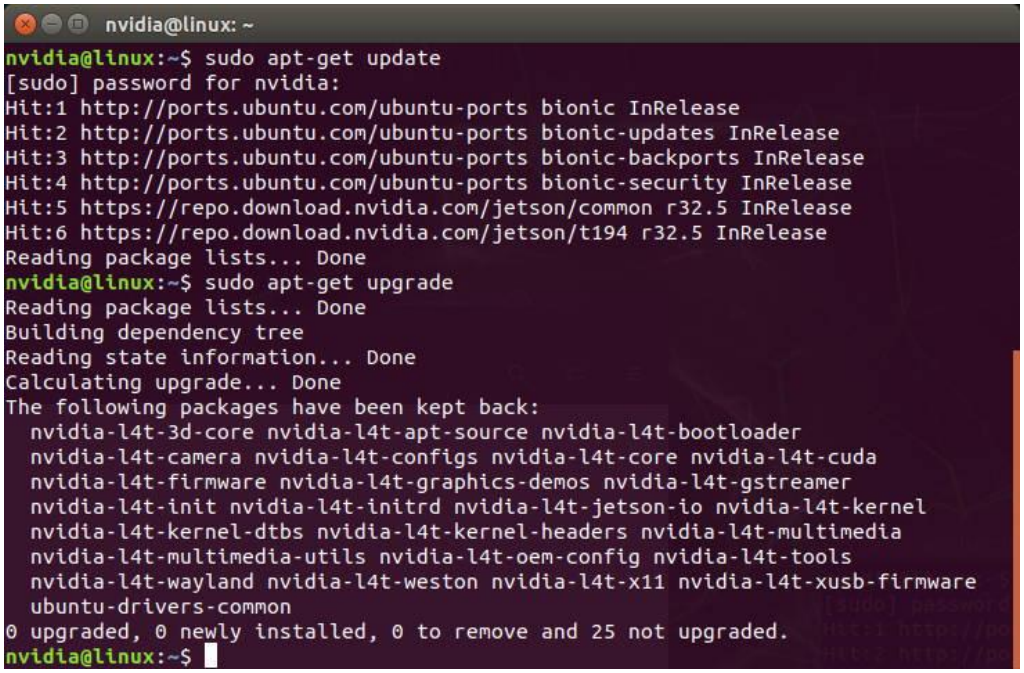
Press “y” to accept installing packages on the Jetson module.



A few minutes later… (it depends on network speed)



At the end of the upgrading step, you can check it again.



As it can be seen, the holding command worked.