Let's Talk about Jetson Nano in 2024

(Harley Lara, May 2024)

In March 2019 NVIDIA introduced the Jetson Nano in two variants, the Jetson Nano 'Module' which is a system-on-module (SoM) and a Jetson Nano 'Developer Kit' which is a carrier board with the Jetson Nano Module to facilitate the development and prototyping of edge AI applications. For the curious, the Jetson Nano contains a Tegra T210 system-on-chip (SoC), which interestingly is the same module that you will find in Jetson TX1 (the first generation of Jetson modules).

With the introduction to the market the Jetson Nano gained a lot of traction due to its price and the ability to offer GPUs with CUDA support at low power (10W max), however since then the hype for the Jetson Nano has dropped drastically, influenced by new introductions such as the Jetson Orin Nano. This blog seeks to describe the current status of the Jetson Nano.

The Current Software Situation

With the Jetson family NVIDIA releases what they call “JetPack SDK” or just “JetPack”, each version of “JetPack” has 3 components, one of them is called “Jetson Linux” (formerly called Linux for Tegra or L4T) and contains; from NVIDIA website “A Board Support Package (BSP) with bootloader, Linux kernel, Ubuntu desktop environment, NVIDIA drivers, toolchain and more. […]“, simplifying it is the operating system running on the Jetson.

Currently (May 29, 2024) the latest version of Jetson Linux available for the Jetson Nano, specifically for the Jetson Nano is version 32.7.4, as part of JetPack version 4.6.4. However, NVIDIA has continued to release new versions of JetPack and Jetson Linux for the Jetson Nano without support for the Jetson Nano. Check this [Previous Jetson Linux Versions](https://developer.nvidia.com/embedded/jetson-linux-archive) for details.

So, what's the problem with this? Let's break it down: The latest JetPack for the Jetson Nano (JetPack 4.6.4) contains Jetson Linux version 32.7.4 with the following relevant features:

- Linux kernel version 4.9
- Based on Ubuntu 18.04
- CUDA version 10

For more details on the features of JetPack version 4.6.4 check Key Features in JetPack.

This is where the problems start to arise, since June 2023 NVIDIA has not released updates that put the Jetson Nano on newer versions of the Linux kernel, or newer versions of Ubuntu such as 22.04 with Long-term-support and newer versions of CUDA, however (here comes the weirdest part) NVIDIA plans to continue selling the Jetson Nano Module until January 2027 according to their Jetson Product Lifecycle, so why continue selling the hardware until 2027 if there will be no more software support?

NVDIA's Attitude in this Regard

As marietto2008 says in his post How to run Ubuntu 22.04 on the Jetson Nano on the NVIDIA Developer forums; *“[...] I try to make the life of my board last as long as possible. [...]”*, and although this perspective is from his individual's situation this same point applies to companies and products that have decided to base their solutions on the Jetson Nano. Similarly viorel.negoita in the post Jetson Nano Availability and Software Support from Nvidia *“I don't understand why Nvidia doesn't provide a more updated operating system, [...] If they don't provide any updates, why sell it until 2027?”*.

Here are NVIDIA's responses to both posts:

- "*Sorry to tell the upstream kernel and Ubuntu 22.04 is out of support scope. Hope other developers can help to share experiences.*".
- "*[...] We have new Orin series including AGX Orin, Ori NX, Orin Nano. Would be great if you can check the platforms.*".

<insert your own interpretation of these answers>. NVIDIA indirectly pushes the end-user to just get the newest hardware (until they decide to release something new), and from here the discussion can extend in many directions, which won't be deepened, but a few are mentioned; e-waste, planned obsolescence.

Note: The above “NVIDIA's responses” section does not put the blame on the forum contributor who responds, they are not responsible for the decisions NVIDIA as a company makes. So no blame against the individuals who responded.

The Current Official “Solution”

Use Ubuntu 18 and dockerize everything, for example for running current versions of Robot Operative System (ROS) Ros2 and ubuntu 22 on jetson nano developer kit. Is there anything wrong with dockerize everything? No, but not all solutions need containers for execution, besides that containers depend on the capabilities of the Host OS, so containers are still dependent on the underlaying tool, CUDA 10 for example.

Keeping the Jetson Nano Alive

Collection of individual efforts to bring newest version of Ubuntu to Jetson Nano:

- marietto2008: How to run Ubuntu 22.04 on the Jetson Nano.
- _Diablo: Ubuntu 22.04 image beta test for jetson nano.
- Roman Shtylman: jetson-nano-image-maker.
- Pythops: jetson-image.

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