Open Hardware and GNU/Linux

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Open source is not limited to software, but also impacts hardware development. RISC-V, first introduced in 2010 at UC Berkeley, is an open source chip design instruction set architecture which tells a chip how to do basic computation, like addition, subtraction, multiplication, etc. RISC-V is gaining traction in the hardware manufacturing space throughout the world, because it lowers barriers to entry and increases chip development speed. OpenRAN, an open source 5G networking stack that started gaining momentum in 2016, is also gaining more attention and has already been embraced by the UK and Japanese governments.

Using open source technology is now the fastest way new products get built and legacy technologies get replaced. Yet as US policymakers develop their industrial policy to compete with China, open source is conspicuously absent.

- Self-driving trash can controlled by Raspberry Pi [4]
By leaning on the advantages of open source, policymakers can pursue an industrial policy to help the US compete in the 21st century in line with our broader values. The alternative is to continue a top-down process that picks winners and losers based on not just technology but also political influence, which only helps individual firms secure market share, not sparking innovation more broadly. A few billion more dollars won’t save Intel from its technical woes, but a healthier ecosystem leveraging open source technology and community would put the US in a better position for the future.

RISC-V & ESP32 based TTGO Handheld T-WATCH K210 AIoT DevKit Works with a 9V Battery

LilyGO TTGO T-Watch K210 AIOT is a rather thick watch development kit based on Kendryte K210 RISC-V AI Processor and ESP32 WiSoC capable of performing AI workloads such as face detection using a USB power source.

We first covered the development kit in June, and the company releases some small variants from time to time with the latest being TTGO Handheld T-Watch K210 with basically the same hardware, plus the addition of a handle that adds a power button, and a compartment for a 9V battery to power the watch/devkit.

I got carried away and built a 36TB home server the size of a toaster oven

I built a 36TB home server this month, and before I tell you about it, I need to make one thing clear: I really don't need 36TB of storage. It's excessive, and the majority of that space will lie empty and unused for years. You could call it overkill, but I'm going to go with prepared. The build is the same either way, but isn't it more fun to be optimistic?

Okay, so I got carried away. But believe it or not, the goal of my home server build, which I've been plotting since quarantine began in March, was to make a practical replacement for my existing server, which I first built in 2014 and have upgraded a few times since then. That server consisted of an i7-4790K CPU, five HDDs (3-4TB each), and one 128GB SSD in a Fractal Design Define Mini case. My server runs headless Ubuntu, which means I control it remotely via a terminal and web browser tools, and mostly runs media center Plex, though I run a Discord bot and a few other things on it, too.

To be able to support up to eight drives, I ordered a well-reviewed SATA expansion card on Amazon, ensuring it had reviews that said it worked fine in Linux and would support full SATA speeds. It ended up being a PCIe x1 card, so my motherboard pick wasn't strictly necessary, but it all worked out fine.
There are many things to consider when moving to embedded Linux® from a real-time operating system (RTOS) for embedded projects. Based on pragmatic experience of helping customers through the decision making process and the actual transition, this white paper provides practical information, so developers can be fully aware of the trade-offs of moving to OSS and the often unmentioned hidden cost of managing a Linux distribution.

*LattePanda Alpha 864: Review the Specs* [9]

**GNU Linux Hardware**

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