

A close-up of Morpheus from the movie The Matrix, wearing his signature black sunglasses. The reflection in the sunglasses shows three figures in a room, likely the iconic red pill/blue pill scene. The image has a slightly grainy, cinematic quality.

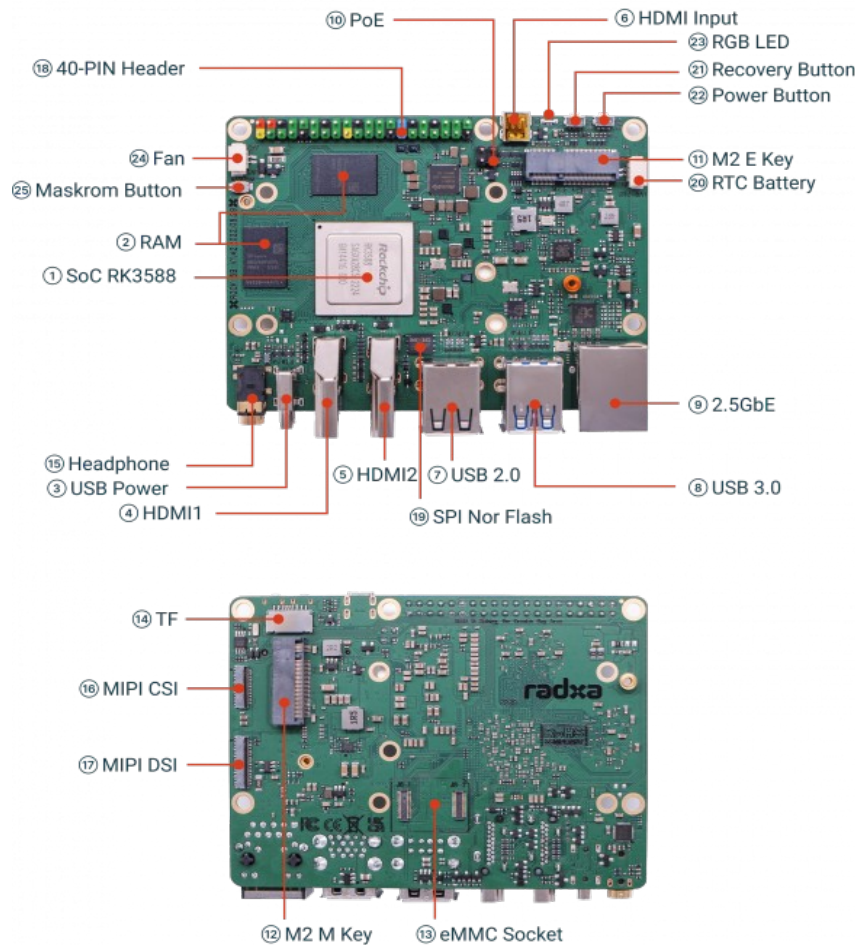
WHAT IF I TOLD YOU

YOUR DESKTOP CASE CAN BE A SERVER RACK

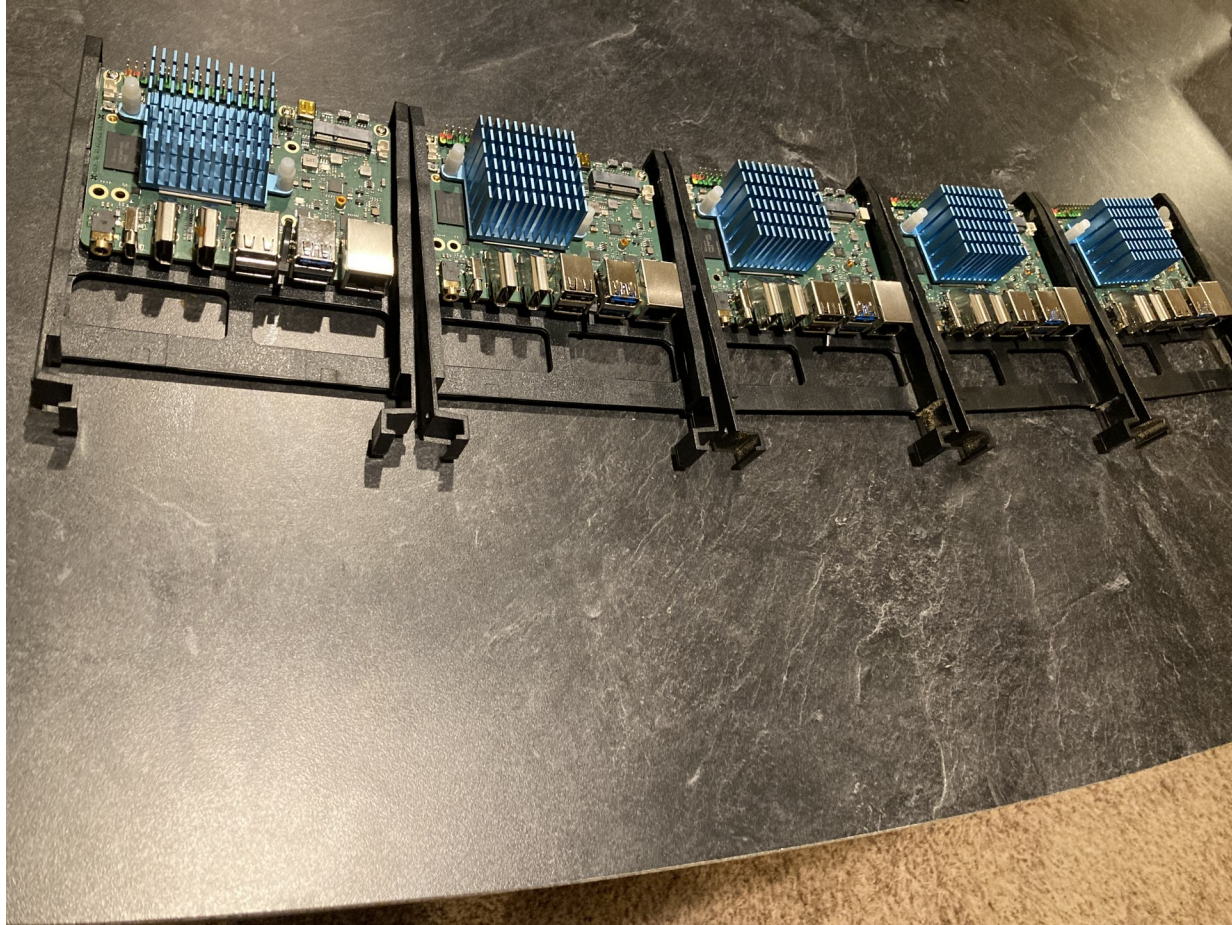
Building a tiny ARM cluster

Hardware:

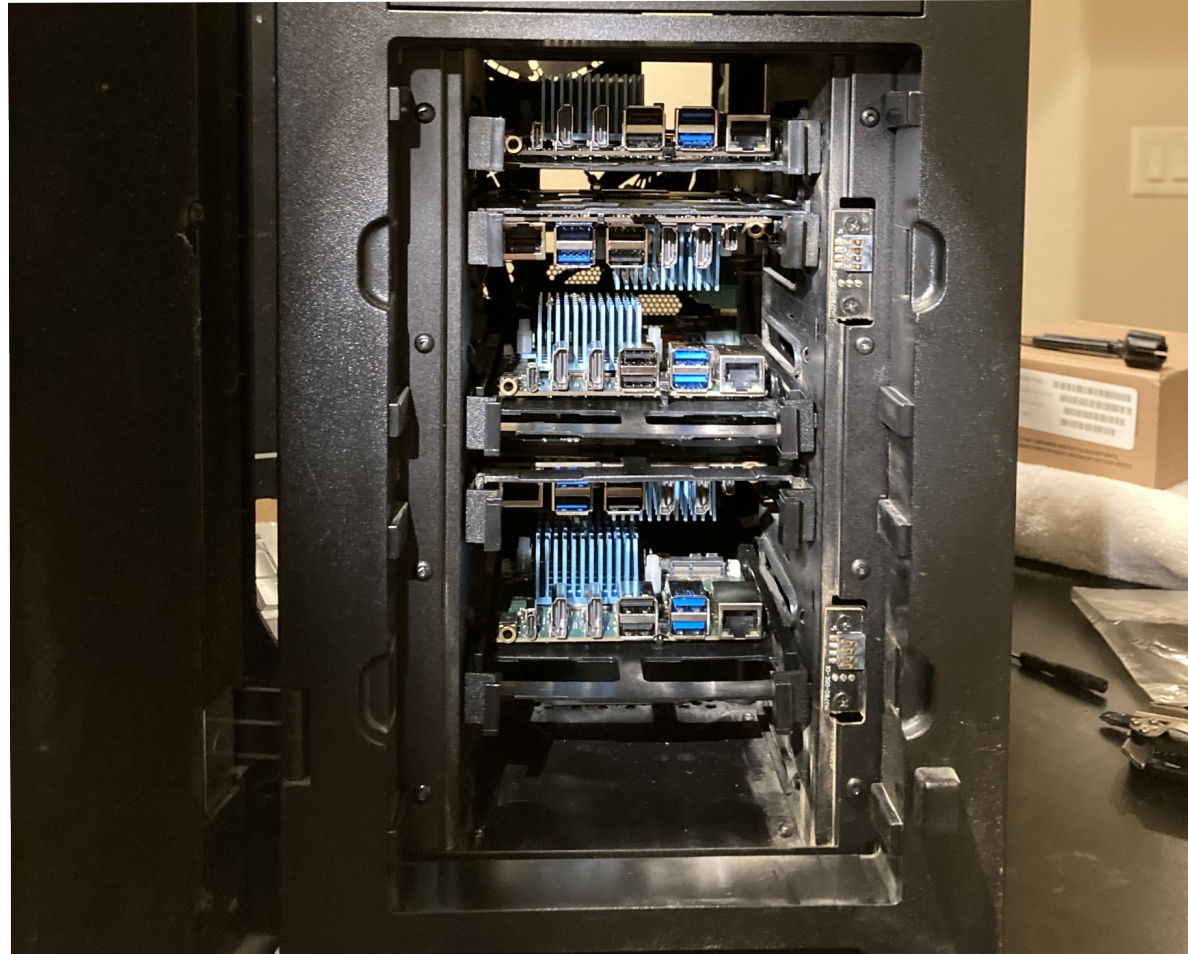
- ROCK 5 Model B (x5)
 - 8 cores, 16 GB ram, NVMe!
 - 15W total: 5V @ 3A via GPIO pins
 - <https://wiki.radxa.com/Rock5/5b>
- 32 GB PNY MicroSD cards (x5)
- 1 TB Samsung 980 SSD (x5)
- Used 8 port 1Gbit switch
- Used desktop case & power supply
- 24-pin ATX breakout board



boards in 3.5" drive trays



mounted in a desktop case



with networking and cooling



powered up and running



Ok, but why?

- 40 cores, 80 GB ram, 5 TB NVMe with just 75 W of power
- Rackmount servers are loud and consume *much* more power
- ARM development testbed / hypervisor / k8s cluster
- NVMe storage for VM hosting & distributed storage
- Self-hosting is cheap-ish
 - Total build cost: ~\$1500 USD (about the price of a laptop)
 - Public cloud would cost that much for 3-6 months

What's done?

- Hardware build
- Stress testing (~25 C idle / ~45 C load)
- Bootstrapping (shell script)
- Node setup (ansible)
- Create / destroy a test VM (ansible)
- Setup VM's for k8s cluster (ansible / kubespray)
 - 5 master nodes and 5 worker nodes distributed across 5 physical nodes
 - Cluster should survive the loss of 2 physical nodes

What's next?

- Platform for future projects
 - Experiment with ceph / distributed storage?
 - distcc for ARM kernel compilation?
 - Develop new k8s microservices?