

Empowering Users

How Ethereum's Low Node Requirements Promote True
Decentralization Over Solana

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Ethereum On ARM

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About US



We help users to run Ethereum nodes in low-powered and resource-constrained devices by installing and setting up the OS and the Ethereum stack.

Running an Ethereum node at home

Nine years after Ethereum's launch, running a node at home on commodity hardware is still possible.

- Why is this so important?
- Why this has been a priority for Ethereum researchers, devs and community



riethereum • 8 yr. ago
diglos76

Let's build an army of Ethereum nodes!

Hi everyone!

I ran into Ethereum several months ago while reading about bitcoin and the blockchain and was quite impressed by some videos explaining the project (most of them by Vitalik himself). During this time I've tried to educate myself on this breakthrough technology. And at this point, I'd like to get a little more involved. I think that one easy way to contribute to this fascinating project is by running a full Ethereum node, so let me share some stuff of my experience of setting up an Ethereum node on Raspberry Pi 3.

While doing some research about the best Ethereum client for my raspberry Pi 3 I realized that pretty much there are no ARM nodes on the network (according to ethnodes.org). Shouldn't be precisely the opposite? ARM devices such as Raspberry Pi have a good performance, are cheap and power-efficient.

I looked into "EthEmbedded" [1] (great project, by the way) but it is mainly focused on Geth and Eth clients and you need to run the Ethereum clients manually. It's built on top of Ubuntu mate (and we need to keep things light). Besides, I was looking something more Flash & Play :-).

So, I compiled Parity from source on my raspberry Pi 3 (which is the most efficient Ethereum client out there [2]) and gave it a try. I was really surprised with the overall performance and thought that it would be great to get an Ethereum node up and running easiest way possible.

So, I built a custom Raspbian image which runs Parity as a boot up service and starts syncing the blockchain with no user interaction. This is what I got so far:

A custom [3] Raspbian [4] image with Ethcore Parity 1.3 [5] integrated. The image is generated using pi-gen [6] (plus a couple of files for Parity installation)

Some remarks:

- Parity was compiled from source according to Ethcore official documentation [7]
- Parity binary is deployed through a debian package [8] (based on the official Ethcore Ubuntu x86 package plus some minor modifications [9])
- MicroSD partition is resized automatically on first boot (this is a default Raspbian feature)
- Parity runs as a Systemd service (as "pi" user) and it is started right after the network goes up. The Systemd option "Restart=always" is enabled for keeping Parity alive in case the process dies or gets killed
- This is a Raspbian Lite Image (no Xorg environment) to save as much resources as possible.
- Installation is pretty much flash and play. The idea is to quickly set up an Ethereum node even by non tech-savvy users.
- Once the full blockchain is synced, Parity cpu load rarely goes beyond 40% which I think it's an outstanding performance for this kind of devices (Ethcore team did an amazing job here).
- You can get the current Parity output by running "sudo systemctl status parity"
- SSH is enabled by default so you can connect remotely to the Raspberry

Final thoughts:

I think there are several reasons to try to increase Ethereum ARM nodes in the coming months:

- Light clients are around the corner and this may affect the total number of Ethereum full nodes.
- Share economy: Devices like Raspberry Pi's should be key components of web3 and IoT infrastructure. Conventional x86 computers are a waste of resources for this kind of tasks
- POS: There's no much information regarding PoS but it would be great to use this kind of devices for the stake process (don't know if this is possible at all)

You can download the Custom Raspbian Image here:

<http://www.ethraspbian.com/downloads/2016-09-09-ethraspbian.img.zip>

For further installation instructions please visit:

<https://github.com/diglos/pi-gen>

Home node runners improve network decentralization

If thousands of individuals run nodes at home:

- **Trust no one:** Anyone can interact with the Ethereum Blockchain with no third parties involved.
- **Network resilience:** Nodes are distributed all over the world.
- **Network Availability:** A decentralized network should be consistently operational (24/7 availability).
- **Credible Neutrality:** The protocol treats all users and transactions equally, without bias.
- **Global Accessibility:** The network can be used by anyone, anywhere
- **Low Staking Barriers:** Solo Stakers can participate in the network security

Solana's approach: Specialized nodes

Requirements	Ethereum	Solana
CPU	4 Core (Min ARM64)	High-performance CPU, 12 cores or more recommended
RAM	16 GB Full / Archive / Validator	256 GB recommended
Storage	1 SSD disk 2 TB	4 <u>NVMe</u> SSDs
Bandwidth	10–20 Mbps upload/download	Symmetric 10GBit/s preferred
Power Consumption	Low, suited for home setup (10w for ARM64 boards)	High. Datacenter type
Technical Demand	Moderate – accessible to more users	High. Advanced setup

Data Center resources for running nodes and validators

Home node runners vs specialized nodes


Solana vs Ethereum

Is a network without home runners decentralized?

- **Nakamoto coefficient:** measures how decentralized a blockchain is by counting the minimum number of independent entities (nodes) required to disrupt or take control of the network. According to this, Solana is Decentralized.
- From our perspective, this is not enough. It is imperative that we are able to verify the chain ourselves. And that means, run our own nodes.

2 Different visions on Blockchain decentralization

- Ethereum: Promotes node runners and stakers at home
- Solana: Promotes specialized node runners in data centers all around the world.



Vitalik: "If you have users that are verifying the chain, even 2/3 of the stakers acting together are not able to change the rules on people without everything breaking. The Ethereum rules can only change through a hard fork that is agreed upon through wide community consensus.".

When we talk about truly decentralization, that means any user can run their own node at home and not rely on a third party or service provider for verifying the Blockchain

Run Your Own Node

Thank you!

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