



Why and How to run a node

(no ETH required)

Johns Gresham
NiceNode



Raise your hand if...

What is a node?

A Full Node is..

“...this software downloads a copy of the Ethereum blockchain and verifies the validity of every block, then keeps it up-to-date with new blocks and transactions, and helps others download and update their own copies.” [\[ethereum.org\]](https://ethereum.org)



Image by: [William Tempest](#)



Why run a node?

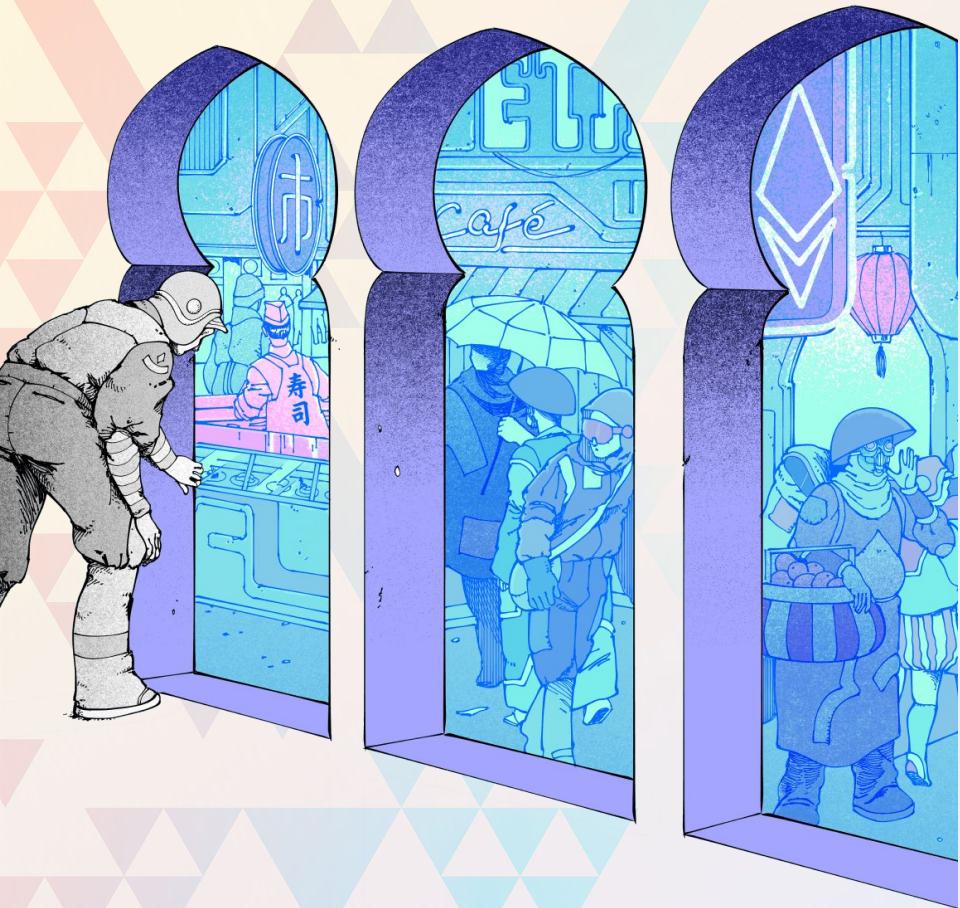
- Support the network
- Avoid centralization lock-in
- Vote on changes to Ethereum
- Defend the network



Why run a node? Support the network

Each additional node that joins the network **adds additional capacity** to the network

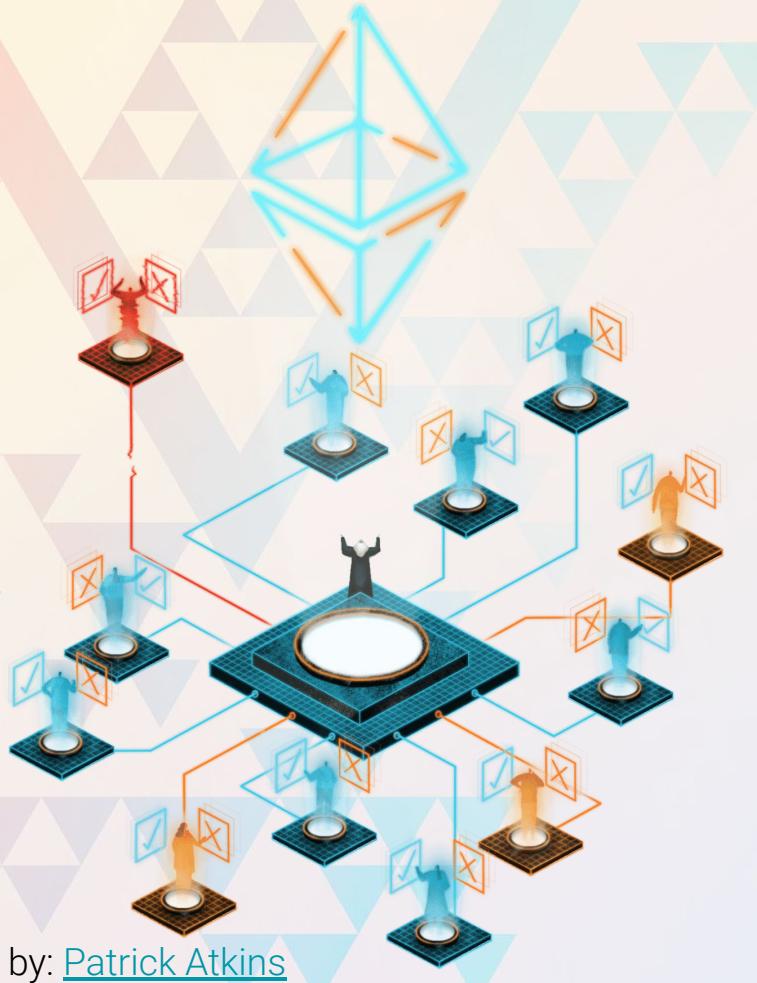
Client diversity - running a node with a minority client **makes Ethereum resistant** to client specific bugs



Why run a node? Avoid lock-in

The foundation for...

“We can build systems that have property X, and we can guarantee that they will preserve property X because changing the rules from X to not-X would require a whole bunch of people to agree to update their software at the same time.” [[Vitalik blog](#)]



Why run a node? Vote on changes

Scenario:

Vitalik and friends create an update which sends 1 ETH every block to devs.eth. They release it as Geth version v1.1337. Vitalik and friends all decide to update their nodes to v1.1337.

Result: Depends on how many users update nodes to v1.1337.

FORK WARS



Why run a node?
Defend the network

We prefer attacks to...

default to failure > default to chaos > default to victory

"If you have a fully validating node, and an attacker tries to push through a chain with different rules, then the attack fails. If some people have a fully validating node but many others don't, the attack leads to chaos."

[\[Vitalik blog\]](#)



Can I run a node?

- Current requirements
- Future requirements

Can I run a node? Current Requirements

Computer

- 8-16GB memory (RAM)
- 2TB fast SSD storage
 - 1TB+ used currently and grows ~10GB per week
 - Some nodes use less (Ex. Besu's "Bonsai" or Nethermind's "no history" settings)
- Modern CPU, less than 5 years old

Internet

- 10Mb/s upload & download
- Unlimited data (no data cap plan)
 - Can use 2TB+ per month
- No slow cellular or WiFi connections

Can I run a node? Solid State Drive Recommendations

Goal: SSD with 10k+ IOPS (Input/Output operations per second)

Internal SSD (Best):

M.2 NVMe

PCI Express

M.2 SATA

*SATA

External NVMe SSD, with connection:

Thunderbolt 4 or 3

USB 3.2

*USB 3.1

* Very likely will have issues syncing a Node

[StorageReview](#) has great SSD reviews with IOPS estimates
[Detailed SSD info](#) for Ethereum nodes, credit to [yorickdowne](#)



Image by: [Tomo Saito](#)

Can I run a node? Future Requirements

Storage

- EIP-4488 “proto-danksharding”
 - Worst-case +2.5TB/year
- EIP-4444 “No historical data”
 - -500GB+
- State expiry “Only store new data”
 - -500GB+
- Stateless Ethereum
 - *No storage required!
 - Difficult upgrade

*Ethereum Portal Network

- Enable everyone to run a **light node**
- Light nodes could run inside of **wallets or dApps**



Section 4

How to run a node?

- Common options
- NiceNode roadmap

How to run a node?

Some options

The screenshot shows a dark-themed web page with a navigation bar at the top. The navigation bar includes links for "Use Ethereum", "Learn", "Developers", "Enterprise", and "Community". There is also a search bar, a language selection icon, and a moon icon for dark mode.

Step 2 – Software

Option 1 – DAppNode

When you're ready with your hardware, the DAppNode operating system can be downloaded using any computer and installed onto a fresh SSD via a USB drive.

[DAppNode Setup](#)

Option 2 – Command line

For maximum control, experienced users may prefer using the command line instead.

See our developer docs for more information on getting started with client selection.

[Command line setup](#)

Option 3 – NiceNode

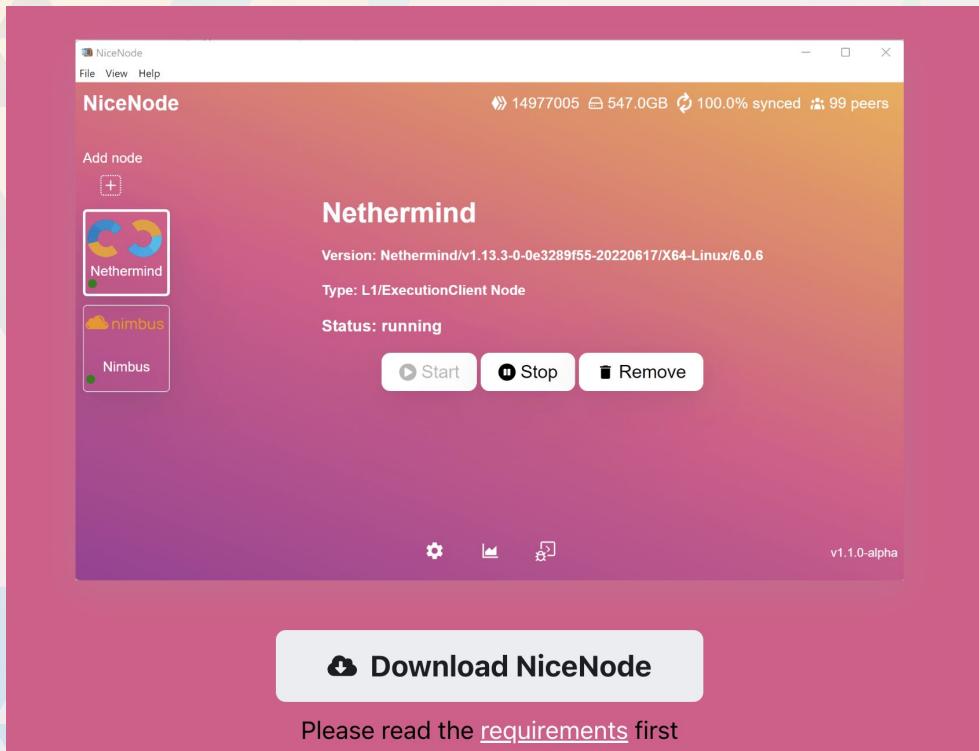
The most simple option - download the NiceNode app and press start

Monitor, control, and change configuration with an easy to understand UI

[Download NiceNode app](#)

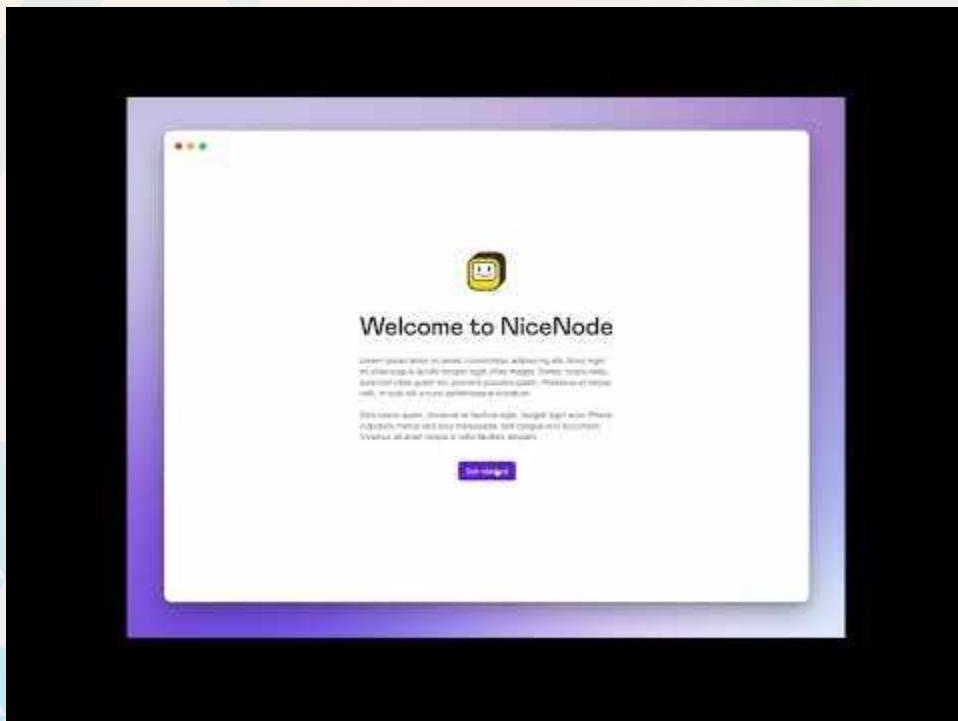
How to run a node?

NiceNode - Alpha release, version 0



How to run a node?

NiceNode: Run a node – just press start



NiceNode - Hardware requirements

Your system is checked with the recommended requirements for the selected clients. You are still able to launch a node with lower specifications but expect some hiccups from time to time.

[Learn more about node requirements](#)

- Processor supported by clients**
Processor: Intel® Core i9-9900K CPU @ 3.60GHz
- Processor has 4 or more cores**
Processor cores: 8
- At least 4GB of system memory (RAM)**
System memory: 32GB
- Storage disk type is SSD**
Disk type: Hard Disk Drive (HDD)
While SSD is recommended you are still able to run a node with a HDD if you have 8GB or more of system memory (RAM) available.
- Available disk space for fast sync is 500GB or more**
Selected disk: Macintosh HD with 924GB free disk space
- Internet connection bandwidth is 25 Mbit/s or more**
Checking connection speed...
- Docker Installation**
Not installed yet. Will be installed in the next step.
Docker helps install the necessary lorem ipsum sit dolor amet.

[Previous](#) [Next step](#)

Cool graphic

How to run a node?

NiceNode - Node UI

The NiceNode Node UI dashboard displays the status of running nodes. On the left, a sidebar lists four nodes: Ethereum node (Mainnet), Ethereum node (3 Validators — Mainnet), Arbitrum Nitro Node (Rinkeby), and Livepeer Orchestrator (Arbitrum One). The main area shows the Ethereum node details:

- Ethereum node**: Validator Node — Ethereum mainnet
- Active validators**: 3 / 3
- Amount Staked**: 96 ETH
- Rewarded**: 1.34967 ETH
- Total balance**: 97.34967 ETH

Below this, tabs for Clients, Earnings, Attestations, Proposals, and Sync committee are visible. The Clients section lists two consensus clients:

- Lodestar: Consensus client — Version 0.41.0 (Update available, In Sync)
- Nethermind: Execution client — Version 1.13.6 (Low peer count, In Sync)

The Validator section shows 3 Validators with their Public key, Status (Active), and Balance (32.0256).

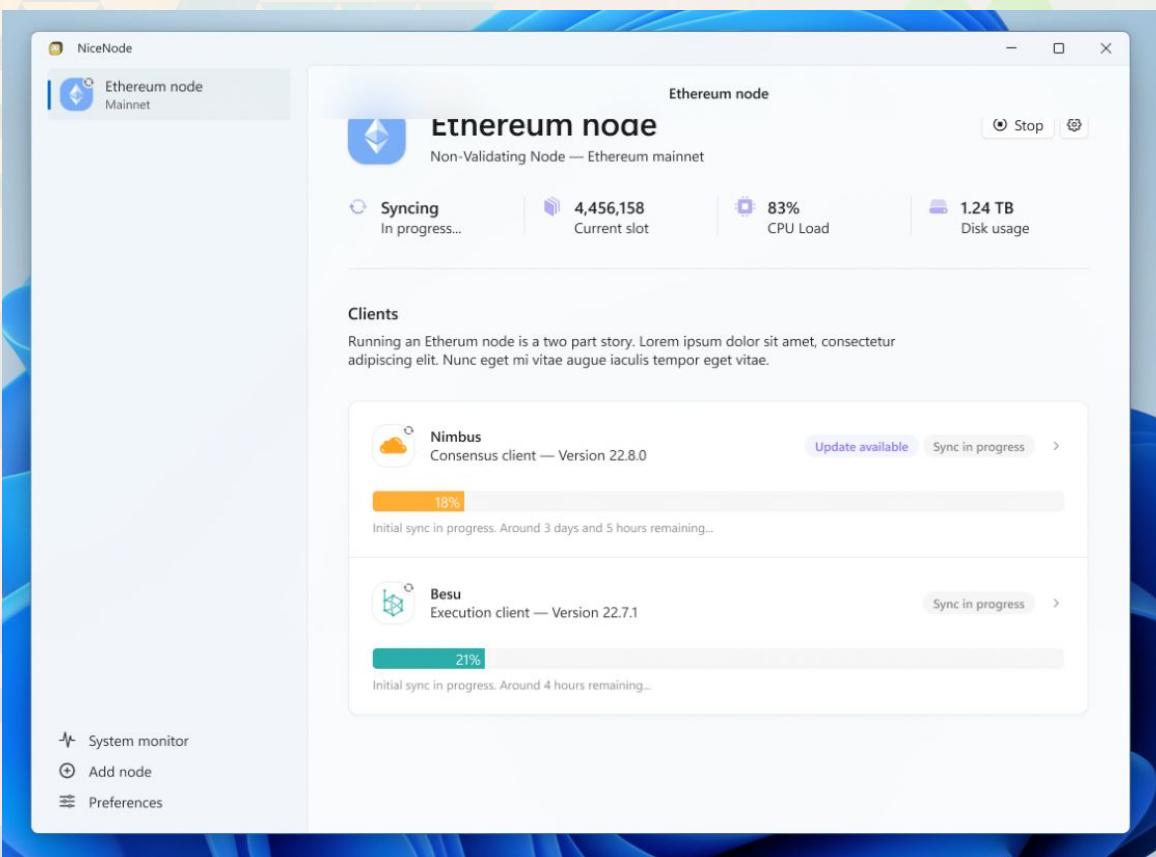
Bottom navigation includes Notifications (4), System monitor, Add node, and Preferences.

The Node settings dialog box contains the following configuration options:

- Sync mode**: Snap (Selected)
- RPC http connections**: Allowed (Enabled)
- RPC websocket connections**: Disabled (Disabled)
- Enabled http API's**: eth, net, web3 (Selected)
- Http connections accepted by node**: nicenode://, http://localhost
- Allowed virtual hostnames for inbound requests**: localhost, host.docker.internal
- WS-RPC listening port**: 8546
- Data location**: Macintosh HD/Users/Danneh/Library/Application Support/NiceNode/nodes/Besu (Move...)
- Remove this node**: A red link.

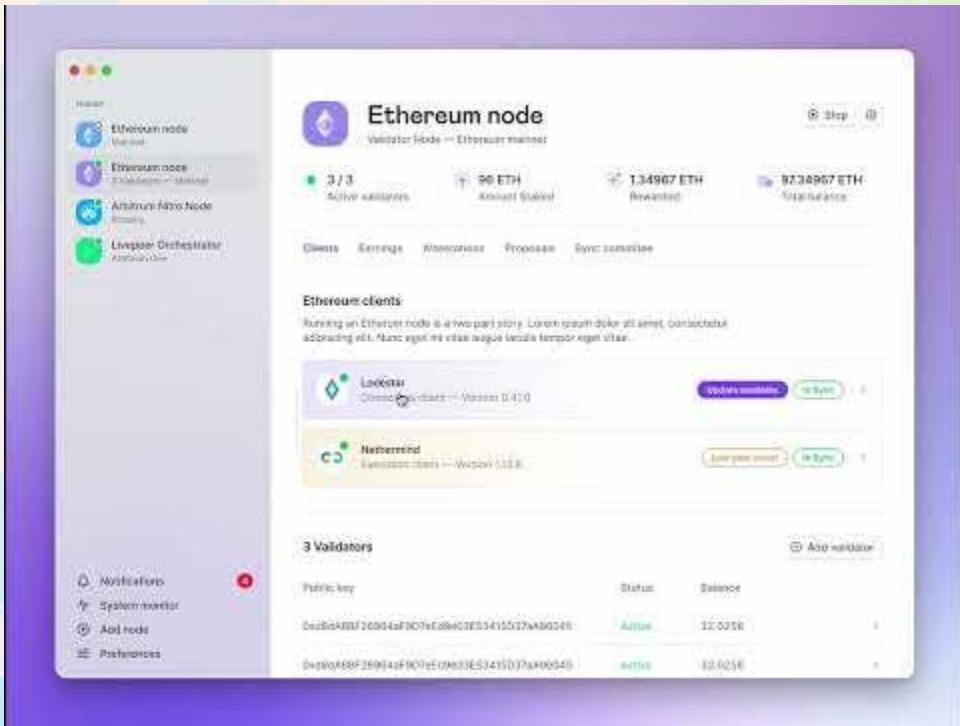
At the bottom are **Cancel** and **Save changes** buttons.

NiceNode - Cross platform, Windows UI



How to run a node?

NiceNode Vision for Staking, L2 nodes, and beyond



NiceNode Vision for Staking, L2 nodes, and beyond

Nodes

- Ethereum node Mainnet
- Ethereum node 3 Validators — Mainnet
- Arbitrum Nitro Node Rinkeby
- Livepeer Orchestrator Arbitrum One

Notifications 4

System monitor

Add node

Preferences

Ethereum node

Validator Node — Ethereum mainnet

3 / 3 Active validators | 96 ETH Amount Staked | 1.34967 ETH Rewarded | 97.34967 ETH Total balance

Clients Earnings Attestations Proposals Sync committee

Earnings

Last month

16 Sep 20 Sep 24 Sep 29 Sep 3 Sep 8 Oct 12 Oct 16 Oct

Period breakdown

Total rewarded 0.41634 ETH + 2.33%	Attestations 0.25412 ETH + 2.33%	Block proposals 0.13548 ETH + 2.33%	Other rewards 0 ETH 0%	Penalties 0.56321 ETH + 1.66%
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History

NiceNode Roadmap

October 2022

Re-designed UI/UX
Super simple on-boarding
More translations!

December 2022

Internal changes (docker-compose) to support more nodes
Additional features like Node notification and, searching logs

February 2023

Layer 2 nodes and web3 infrastructure nodes like Livepeer or Radicle

It is critical to Ethereum's mission of decentralization, censorship resistance, and resiliency for users to be able to run nodes.



Image by: [William Tempest](#)

The NiceNode mission:
Simplify node running



Image by: [William Tempest](#)



Thank you! Gracias a todos!

Johns Gresham

NiceNode, <https://nicenode.xyz>

johnsgresham@gmail.com



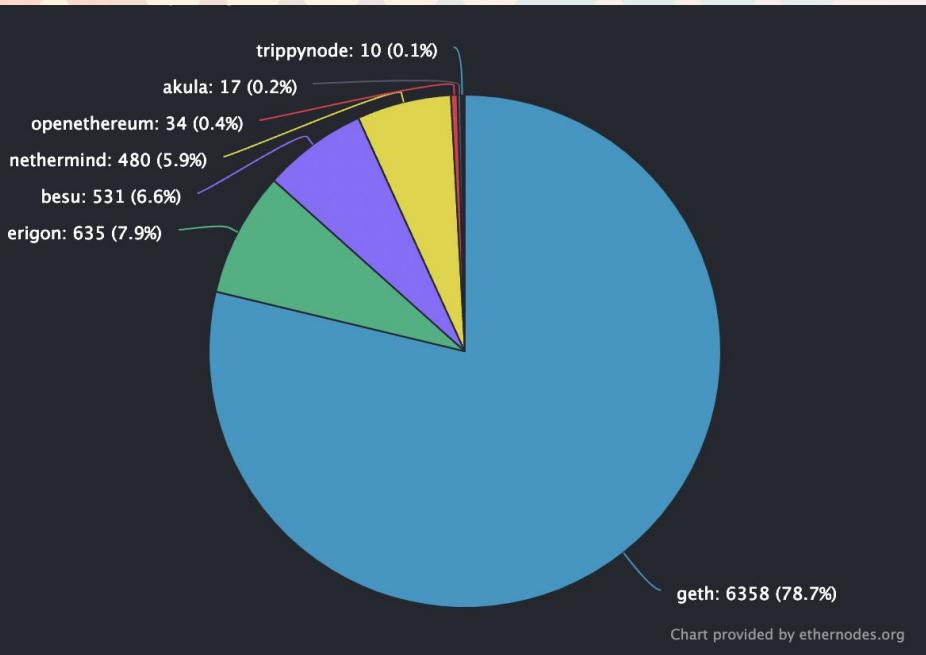
@nicenodeapp
@sirjohnsgresham



How can I help?

All help is welcome... Developers,
writers, community, designers,
translators!

Join our [Discord](#), reach out on
Twitter ([NiceNode](#) or [Johns Gresham](#)),
translate on [Crowdin](#)



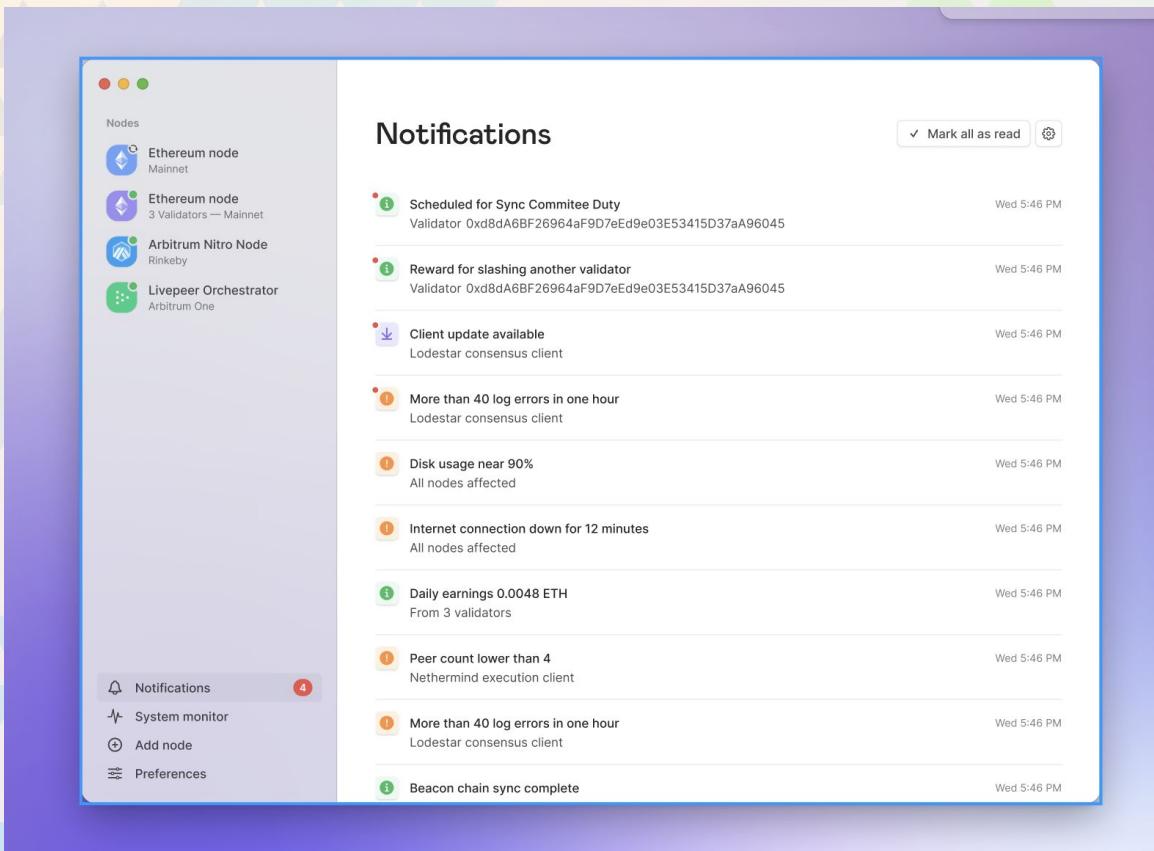
Why run a node? Client Diversity

"Improve Ethereum's resilience by using a minority client" [<https://clientdiversity.org/>]

78% of nodes use the Geth client.

A bug in the Geth client could cause a big problem for Ethereum

NiceNode Notifications UI



NiceNode - Node Specification JSON

```
84  /**
85   * It is the highest level object for introducing a new Node.
86   * It contains all the necessary information required to display,
87   * create, run, and configure the node.
88   */
89 export type NodeSpecification = [
90   /**
91    * A unique human-readable identification string for the node
92    * specId: string;
93    * The specification version. Used for applying spec changes to nodes
94    * that are current running on previous spec versions.
95    *
96    * version: string;
97    * The name that users will see
98    *
99    */
100  displayName: string;
101  execution: NodeExecution;
102  systemRequirements?: SystemRequirements;
103  /**
104   * Todo: Translate common data requests shown in NiceNode
105   * to the node specific API call and parsing
106   */
107  rpcTranslation?: NiceNodeRpcTranslation;
108  configTranslation?: ConfigTranslationMap; Johns Gresham, 4 months ago
109  iconUrl?: string;
110  /**
111   * Image URL for the node icon
112   */
113  category?: string;
114  /**
115   * Documentation URLs for the node. NiceNode will show users these
116   * documentation?: { default?: string; docker?: string; binary?: string };
117  /**
118   * Is the node in alpha or beta?
119   */
120  nodeReleasePhase?: 'alpha' | 'beta';
121];
122
```