



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]

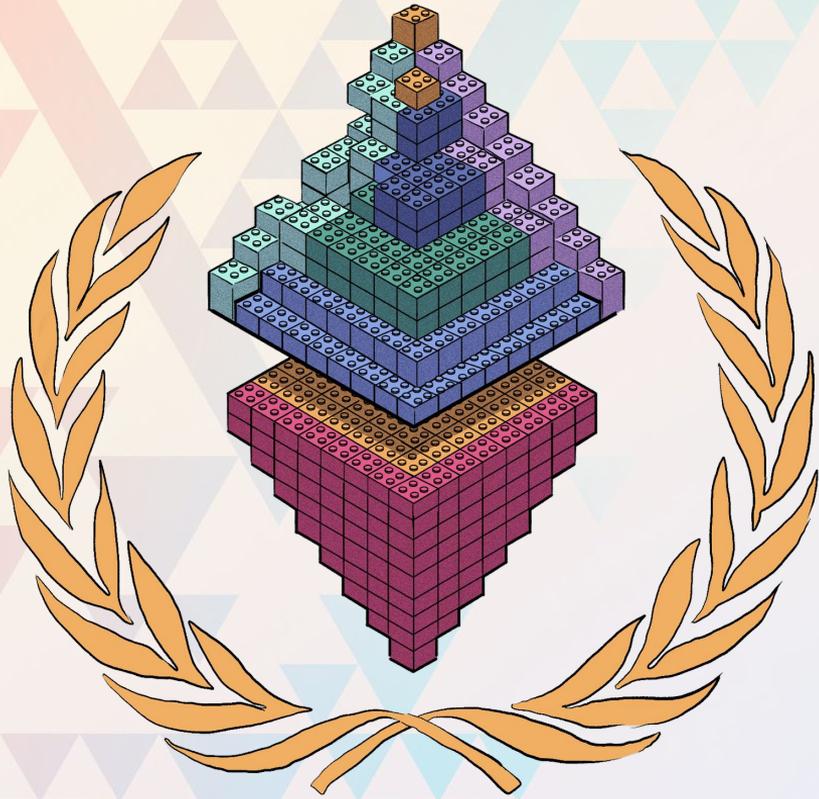


Image by: [William Tempest](#)



Why run a node?

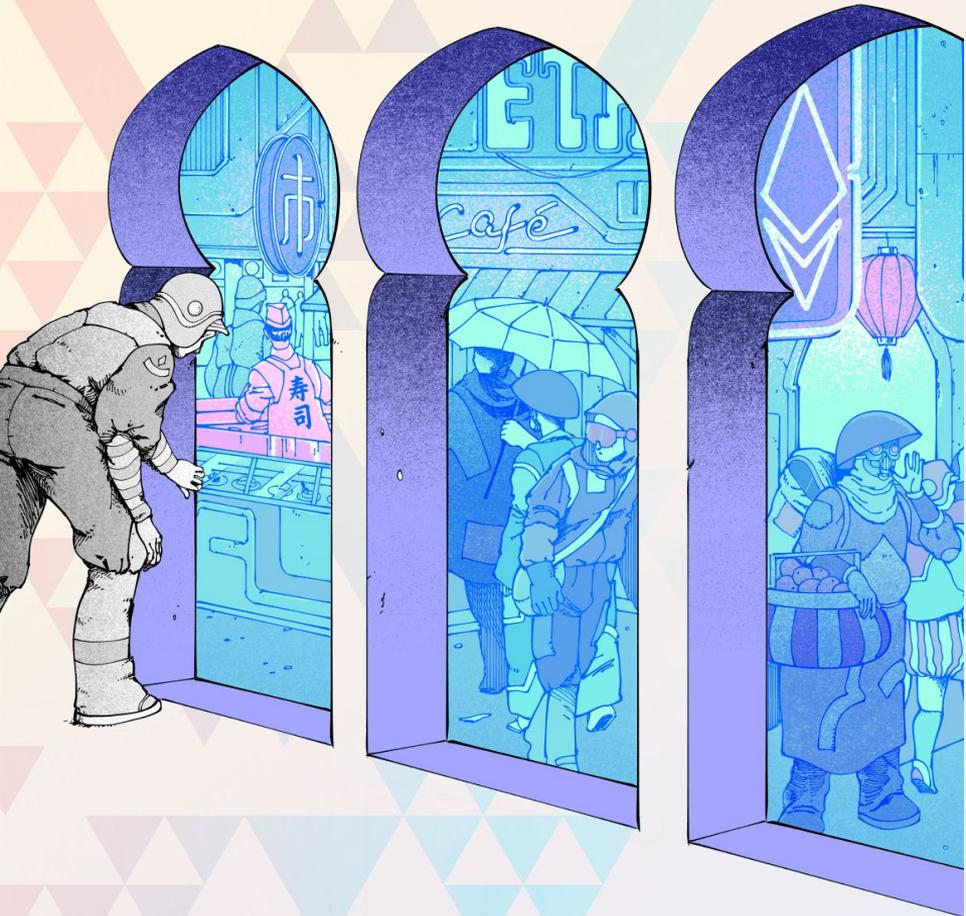
- Support the network
- Avoid centralization lock-in
- Vote on changes to Ethereum
- Defend the network



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 dev.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**



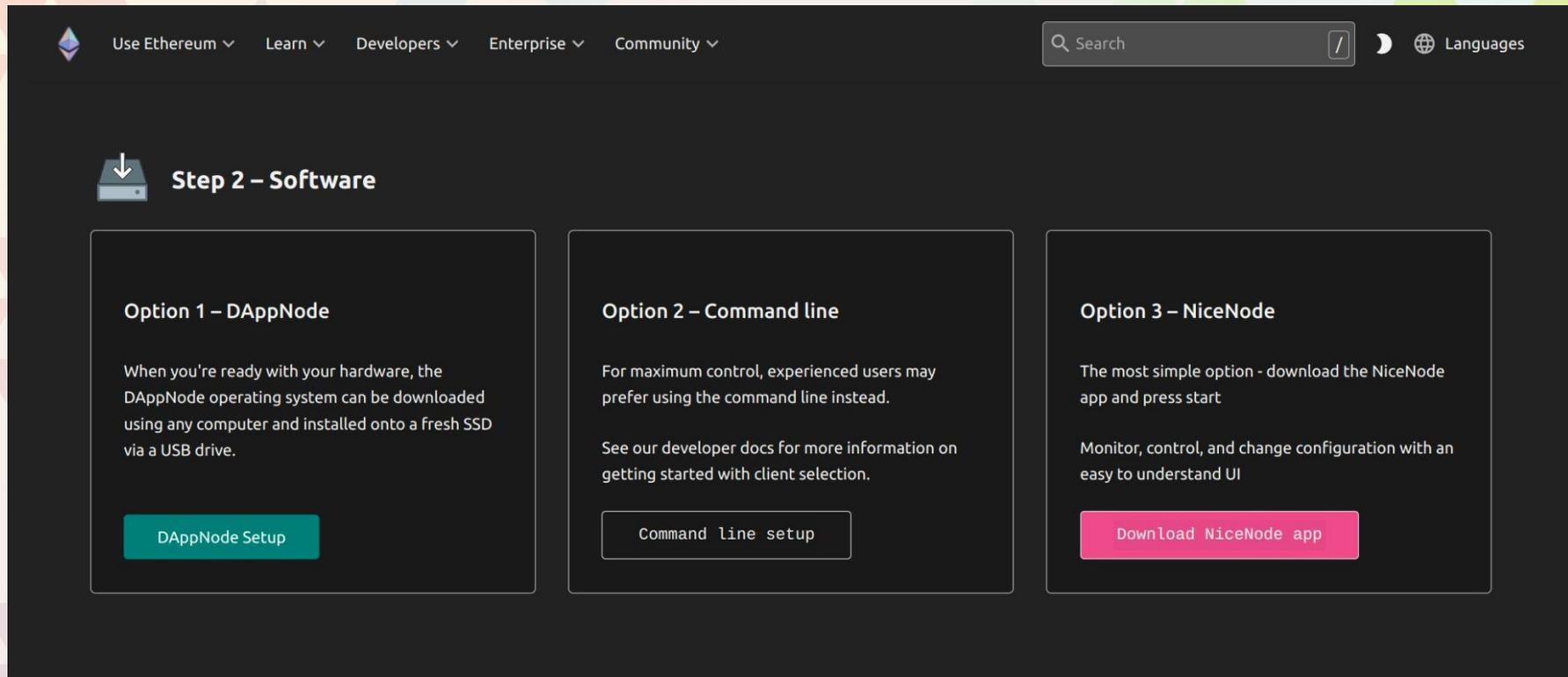
Section 4

How to run a node?

- Common options
- NiceNode roadmap

How to run a node?

Some options



The screenshot shows the Ethereum website's navigation bar with links for 'Use Ethereum', 'Learn', 'Developers', 'Enterprise', and 'Community'. A search bar and a 'Languages' dropdown are also visible. The main content area is titled 'Step 2 - Software' and features three distinct installation options, each with a descriptive paragraph and a corresponding button.

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

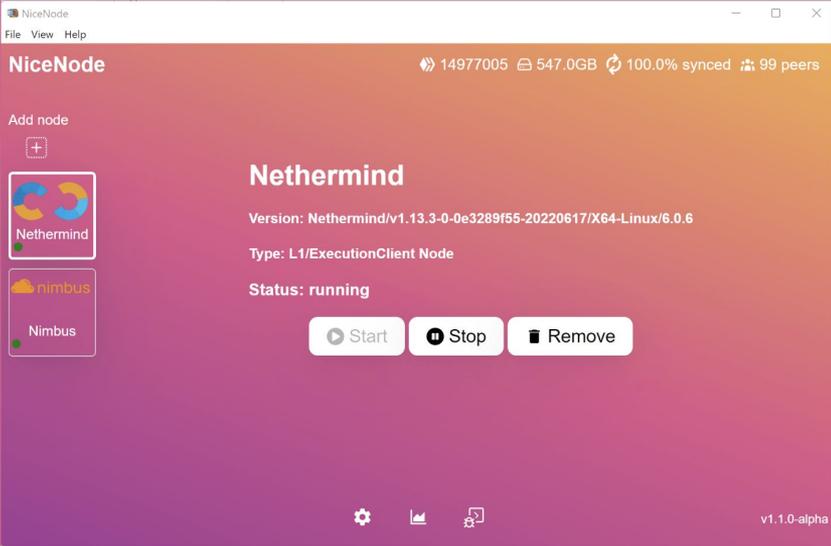
The most simple option - download the NiceNode app and press start

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

[Download NiceNode app](#)

How to run a node?

NiceNode - Alpha release, version 0



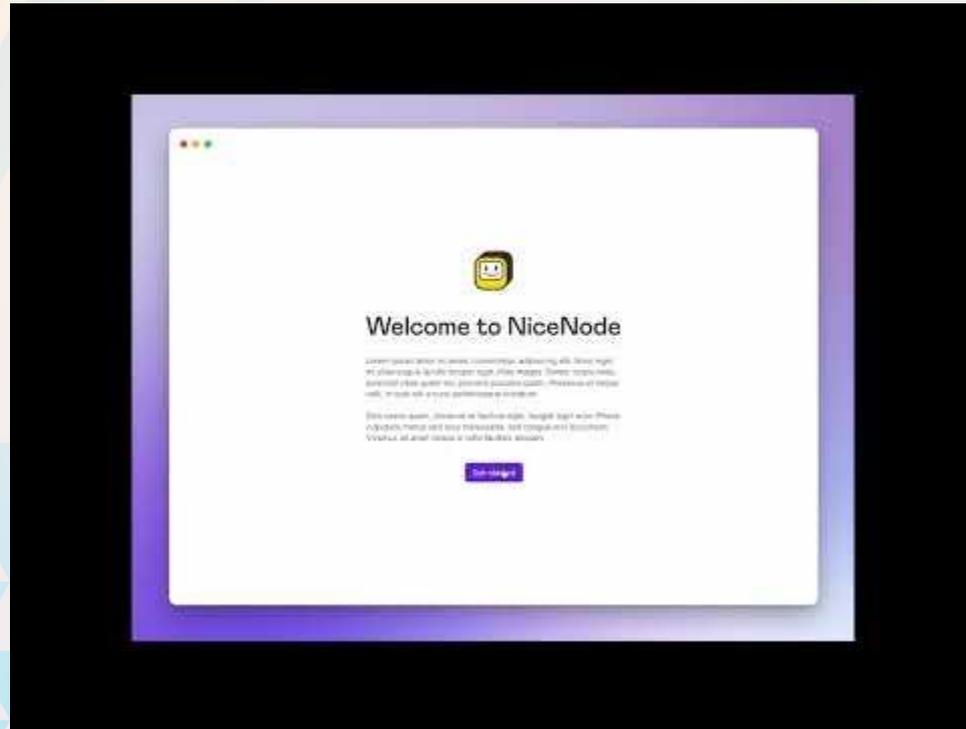
The screenshot shows the NiceNode application window. At the top, it displays the title 'NiceNode' and a menu bar with 'File', 'View', and 'Help'. Below the menu bar, there is a status bar showing '14977005', '547.0GB', '100.0% synced', and '99 peers'. The main interface is divided into two sections. On the left, there is an 'Add node' section with a plus icon and two nodes listed: 'Nethermind' (with a blue and red circular logo) and 'Nimbus' (with a yellow and orange logo). On the right, the 'Nethermind' node is selected and detailed. It shows the version 'Nethermind/v1.13.3-0-0e3289f55-20220617/X64-Linux/6.0.6', the type 'L1/ExecutionClient Node', and the status 'running'. Below this information are three buttons: 'Start', 'Stop', and 'Remove'. At the bottom of the window, there are icons for settings, a dashboard, and a help icon, along with the version 'v1.1.0-alpha'. Below the screenshot, there is a large button that says 'Download NiceNode' and a line of text that says 'Please read the [requirements](#) first'.



A language selection dropdown menu with a blue header and a white body. The header contains the text 'English'. The body contains a list of languages: 'Chinese', 'Español', 'French', 'German', 'Japanese', and 'Vietnamese'. Below the list is a button with the text 'English' and a downward arrow.

How to run a node?

NiceNode: Run a node – just press start



NiceNode - Hardware requirements

Node 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 hickups 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

How to run a node?

NiceNode - Node UI

The screenshot shows the main dashboard for an Ethereum node. On the left is a sidebar with navigation options: Nodes, Notifications, System monitor, Add node, and Preferences. The main area displays the node's status and statistics.

Ethereum node

Validator Node — Ethereum mainnet

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

Buttons: Stop, Settings

Navigation tabs: Clients, **Earnings**, Attestations, Proposals, Sync committee

Ethereum clients

Running an Ethereum node is a two part story. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nunc eget mi vitae augue iaculis tempor eget vitae.

- Lodestar** Consensus client — Version 0.41.0 Update available In Sync
- Nethermind** Execution client — Version 1.13.6 Low peer count In Sync

3 Validators

Add validator

Public key	Status	Balance
0xd8dA6BF26964aF9D7eE9e03E53415D37aA96045	Active	32.0256
0xd8dA6BF26964aF9D7eE9e03E53415D37aA96045	Active	32.0256

The screenshot shows the 'Node settings' dialog box with various configuration options.

Node settings

Sync mode Snap

RPC http connections Allowed

RPC websocket connections Disabled

Enabled http API's eth x net x web3 x

Additional info lorem ipsum dolor sit amet, consectetur adipiscing elit. Nunc eget mi vitae augue iaculis tempor eget. [Learn more](#)

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/Appli.../NiceNode/nodes/Besu Move...

[Remove this node](#)

Cancel Save changes

NiceNode - Cross platform, Windows UI

The screenshot displays the NiceNode application window. The title bar reads "NiceNode". On the left, a sidebar shows "Ethereum node Mainnet". The main content area is titled "Ethereum node" and features the "Ethereum node" logo and name, with the subtitle "Non-Validating Node — Ethereum mainnet". A "Stop" button is visible in the top right. Below this, four status cards are shown: "Syncing" (In progress...), "4,456,158 Current slot", "83% CPU Load", and "1.24 TB Disk usage".

Clients
Running an Ethereum node is a two part story. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nunc eget mi vitae augue iaculis tempor eget vitae.

Nimbus
Consensus client — Version 22.8.0 Update available Sync in progress

18%
Initial sync in progress. Around 3 days and 5 hours remaining...

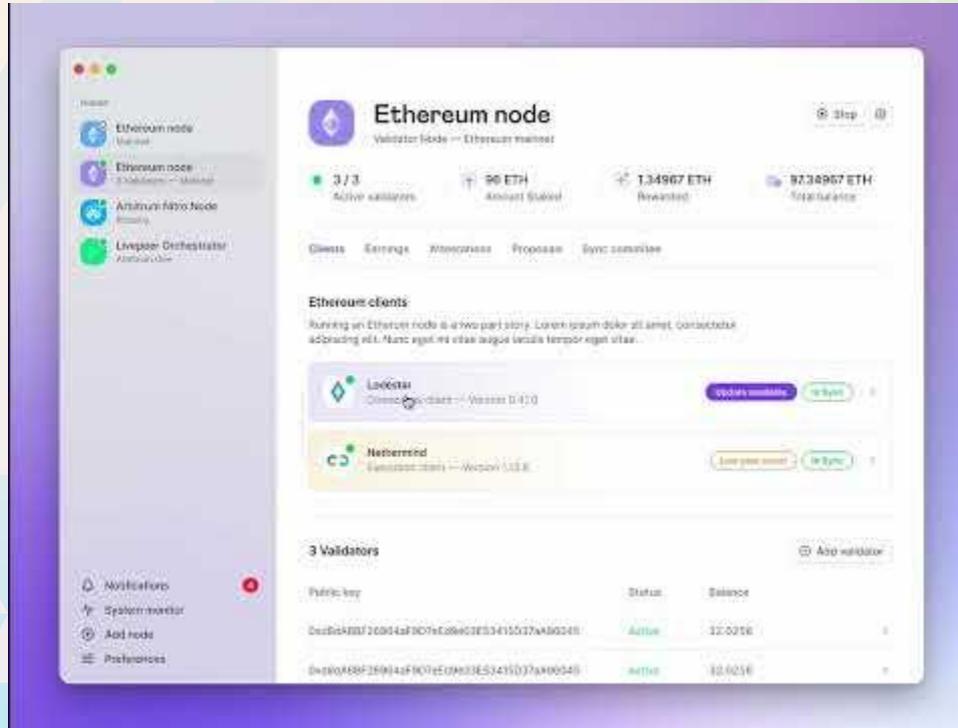
Besu
Execution client — Version 22.7.1 Sync in progress

21%
Initial sync in progress. Around 4 hours remaining...

System monitor
Add node
Preferences

How to run a node?

NiceNode Vision for Staking, L2 nodes, and beyond



NiceNode Vision for Staking, L2 nodes, and beyond

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)

Period	Total rewarded	Attestations	Block proposals	Other rewards	Penalties
Current	0.41634 ETH (+2.33%)	0.25412 ETH (+2.33%)	0.13548 ETH (+2.33%)	0 ETH (0%)	0.56321 ETH (+1.06%)

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.

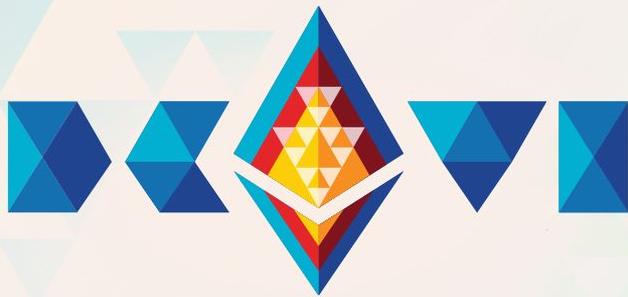


Image by: [William Tempest](#)

The NiceNode mission:
Simplify node running



Image by: [William Tempest](#)



Thank you! Gracias a todos!

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[@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

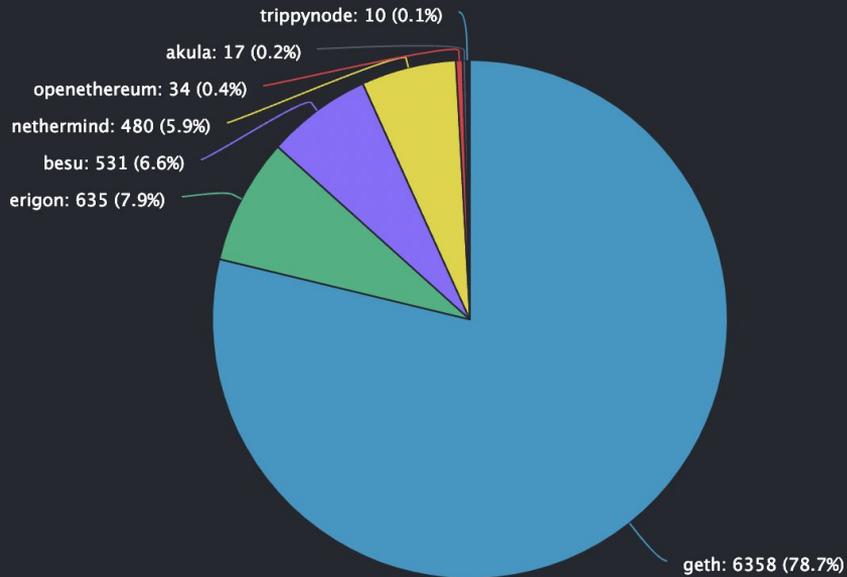


Chart provided by ethernodes.org

NiceNode Notifications UI

The screenshot displays the NiceNode Notifications UI. On the left is a sidebar with a 'Nodes' section listing four nodes: 'Ethereum node Mainnet', 'Ethereum node 3 Validators — Mainnet', 'Arbitrum Nitro Node Rinkeby', and 'Livepeer Orchestrator Arbitrum One'. Below this is a 'Notifications' section with a bell icon and a red badge showing '4'. Other sidebar options include 'System monitor', 'Add node', and 'Preferences'. The main content area is titled 'Notifications' and features a 'Mark all as read' button and a settings gear icon. It contains a list of ten notifications, each with an icon, a title, a description, and a timestamp of 'Wed 5:46 PM'.

Icon	Notification Title	Description	Timestamp
Info	Scheduled for Sync Committee Duty	Validator 0xd8dA6BF26964aF9D7eEd9e03E53415D37aA96045	Wed 5:46 PM
Info	Reward for slashing another validator	Validator 0xd8dA6BF26964aF9D7eEd9e03E53415D37aA96045	Wed 5:46 PM
Update	Client update available	Lodestar consensus client	Wed 5:46 PM
Error	More than 40 log errors in one hour	Lodestar consensus client	Wed 5:46 PM
Warning	Disk usage near 90%	All nodes affected	Wed 5:46 PM
Warning	Internet connection down for 12 minutes	All nodes affected	Wed 5:46 PM
Info	Daily earnings 0.0048 ETH	From 3 validators	Wed 5:46 PM
Warning	Peer count lower than 4	Nethermind execution client	Wed 5:46 PM
Error	More than 40 log errors in one hour	Lodestar consensus client	Wed 5:46 PM
Info	Beacon chain sync complete		Wed 5:46 PM

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   /** A unique human-readable identification string for the node */
91   specId: string;
92   /** The specification version. Used for applying spec changes to nodes
93    * that are current running on previous spec versions.
94    *
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;
109  iconUrl?: string;
110  /** Image URL for the node icon */
111  category?: string;
112  /** Documentation URLs for the node. NiceNode will show users these */
113  documentation?: { default?: string; docker?: string; binary?: string };
114  /** Is the node in alpha or beta? */
115  nodeReleasePhase?: 'alpha' | 'beta';
116 };
117
```

Johns Gresham, 4 months ago