RESEARCH

From CeFi to DeFi:

how staking is shaping
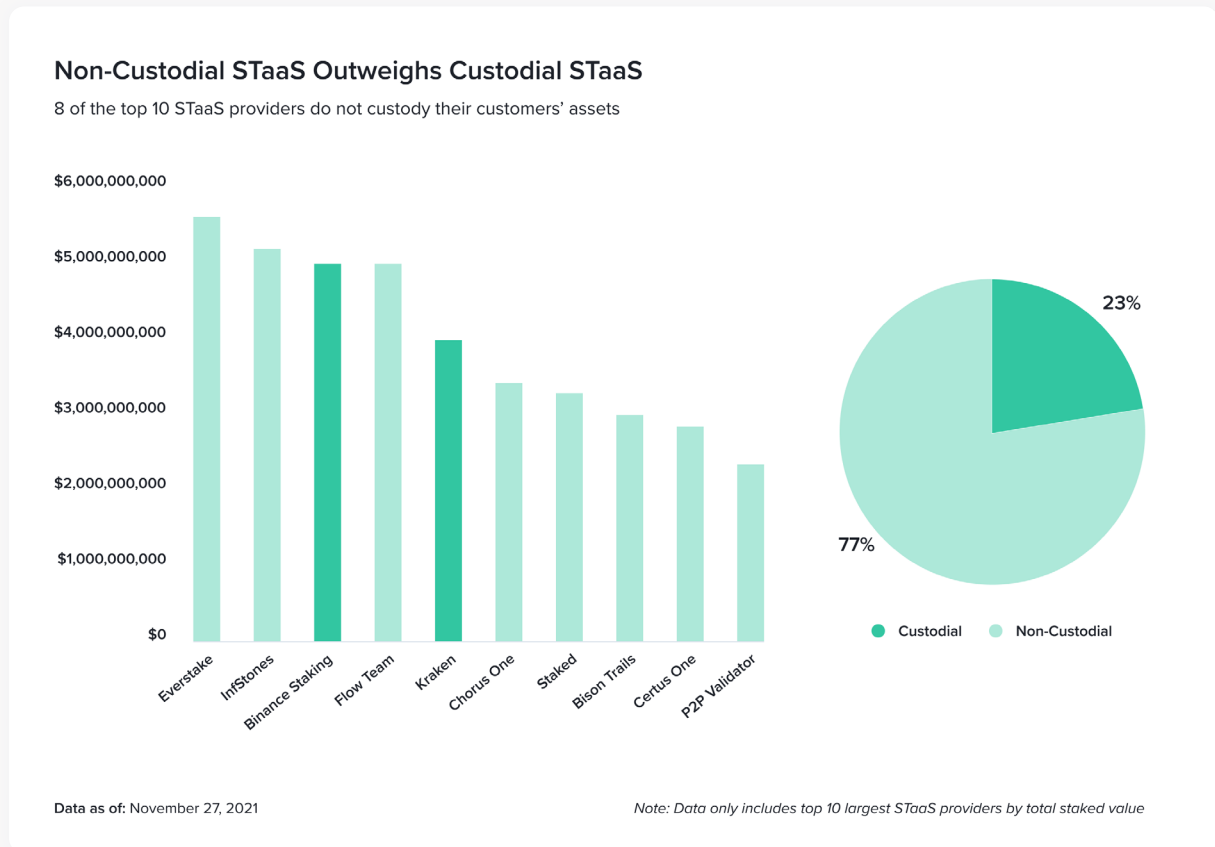
the crypto investment landscape

Content

PART I

The Proof of Stake industry in 2023

A plethora of providers enable today's staking industry

Today's staking industry relies on a wide variety of players, including not only staking providers but also hardware and infrastructure providers, software developers, and liquid staking providers. Delegated staking is straightforward for token holders, but to access staking services across the token landscape, they must often seek out multiple service providers. First and foremost are the **"Staking-as-a-Service"** (STaaS) providers. These are professional validator companies that operate staking infrastructure. For networks that support delegated staking, StaaS providers do not typically [1] need to take custody of assets being staked on their infrastructure. The staker keeps the assets within their wallet or account and participates in on-chain validation via the infrastructure of the validator. As **shown by Messari** in the graphic below, the majority of STaaS providers are non-custodial.

Non-Custodial STaaS Outweighs Custodial STaaS

8 of the top 10 STaaS providers do not custody their customers' assets

Data as of: November 27, 2021

Note: Data only includes top 10 largest STaaS providers by total staked value
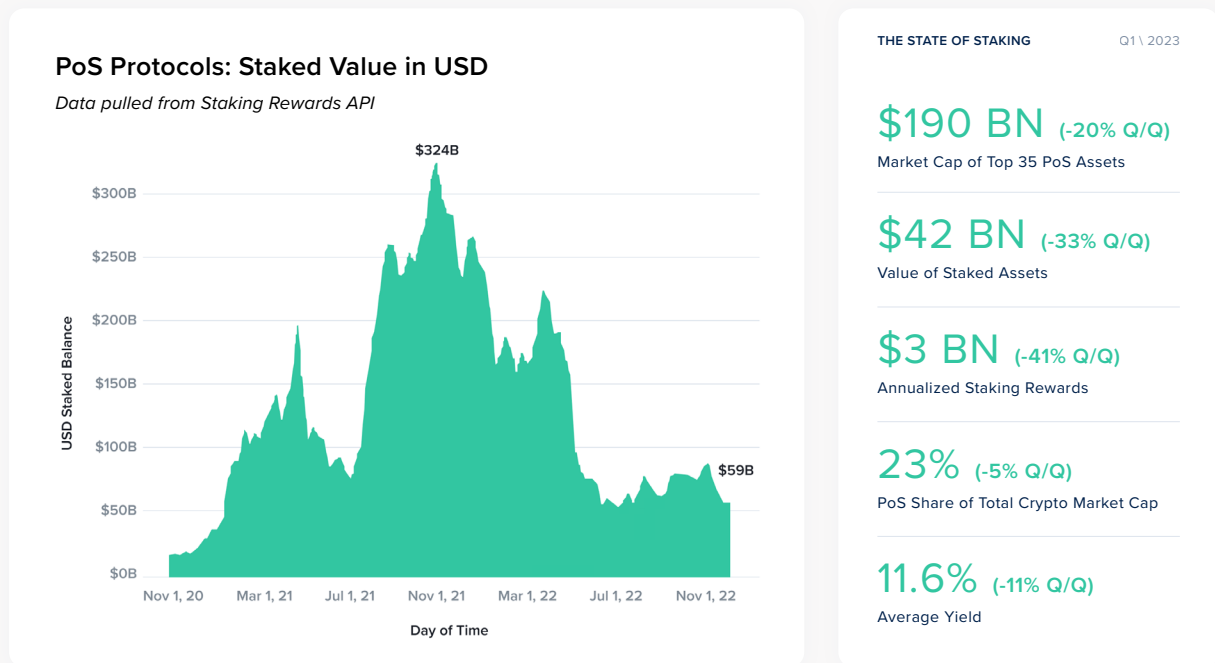
Source: *Messari.io*

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[1] Some blockchains require their validators to take custody of the staked assets, for example, **MINA**

In contrast to non-custodial STaaS providers, **custodians and exchanges** enable intermediated participation in staking. Custodians like Finoa allow users to choose where they wish to stake their assets, and **staking happens directly** from users' segregated accounts. Exchanges, by comparison, typically force users to stake via the exchange's infrastructure. They combine staked funds in pooled accounts, resulting in reduced transparency for users. This pooling of staked funds resulted in the SEC **shutting down** Kraken's staking service and classifying its staking offering as a security.

Users of **self-custody wallets** benefit from the highest level of flexibility but also take on the most responsibility for the custody of their own assets and the choice of which staking provider to stake with.

The staking industry has grown, matured, and consolidated

PoS Protocols: Staked Value in USD
Data pulled from Staking Rewards API

Source: *Stakingrewards.com*

THE STATE OF STAKING   Q1 \ 2023

$190 BN (-20% Q/Q)
Market Cap of Top 35 PoS Assets

$42 BN (-33% Q/Q)
Value of Staked Assets

$3 BN (-41% Q/Q)
Annualized Staking Rewards

23% (-5% Q/Q)
PoS Share of Total Crypto Market Cap

11.6% (-11% Q/Q)
Average Yield

Source: *Staked / Kraken*

The size of the staking industry is directly correlated with three factors: the price of the crypto assets, the percentage of assets staked, and the overall crypto market capitalization. In Q1 of 2023, **Staked. us** estimated the value of staked assets at $42b. Those assets produce an annual $3b in staking rewards. If validators took a 5% commission on staked assets, they would earn $150m per year. This is an oversimplification, but it gives a rough estimate of the staking industry's revenue.

Due to the volatile prices of crypto assets, the staking industry also experiences significant volatility. The above chart from *Staking Rewards'* 2022 industry **report** shows the dramatic rise and fall in staked value over the course of 2021.

[1] Some blockchains require their validators to take custody of the staked assets, for example, **MINA**

FINOA

Ethereum is increasingly important to the staking industry

Ethereum's PoS **Beacon Chain** came online in December 2020. Since then, a steadily increasing **amount** of ETH has been staked: over 17 million ETH are now staked, worth $27b. That makes Ethereum by far **the blockchain with the most dollar value staked**, as shown in the table. This is no surprise, considering that Ethereum is the largest PoS blockchain, with a market cap of $189b.

But Ethereum staking has a lot of room to grow, with only 14% of its supply staked. This number is in comparison to other blockchains which have between 40-80% of supply staked. The staking industry is becoming focused on Ethereum, as clearly visible in the multicolored graphic.

PROJECT	MARKET CAP ($b)	STAKED %	STAKED ($b)
ETH ETH	250.8	14.3%	37.4
Cardano ADA	15.5	66.6%	10.3
Polygon MATIC	10.8	38.9%	4.2
Solana SOL	9.8	72.1%	7.1
Polkadot DOT	8.4	47.3%	4.0
TRON TRX	6.0	43%	2.6
Cosmos ATOM	3.7	69.3%	2.6
Near NEAR	2.1	46.5%	1.0

Source: *Stakingrewards.com*

$1B+ Staked Protocols - Total USD Staked Balance
*Data pulled from Staking Rewards API*
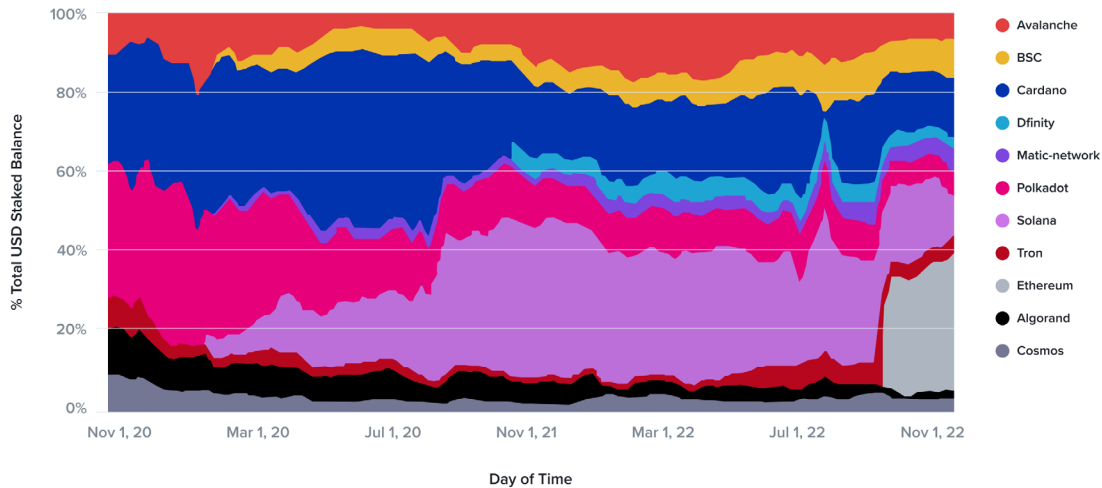
Ethereum (⬤) makes up a significant portion of staked assets. Source: **Staking Rewards report**

Ethereum MEV generates non-inflationary validator rewards

Another area where Ethereum leads the way is MEV - Miner Extracted Value. It refers to the economic value that can be extracted by reordering transactions within a block or adding transactions to a block. As we explained in a **recent article**, the MEV-Boost software from Flashbots enables fair MEV capture and distribution. The graphic from *mevboost.pics* shows that over 80% of Ethereum blocks are now being produced using MEV-Boost. Critically, Flashbots **estimates** 99% of MEV transactions are now coming from arbitrage.

As shown in the graphic from *Parsec.finance*, Ethereum's MEV rewards and transaction execution fees now make up a third of staking revenue. This is in contrast to many other blockchains which pay validators with newly created tokens, which contribute to **inflation** of the overall token supply.
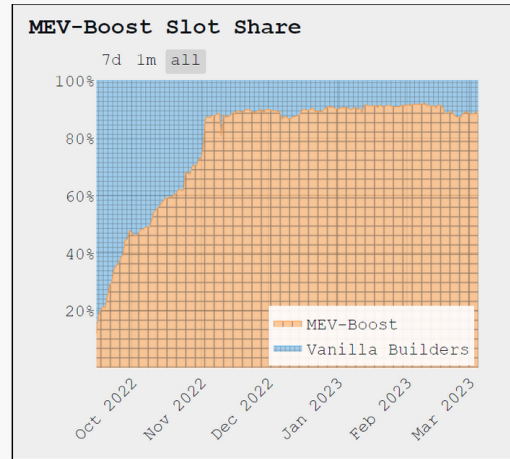


Source: *Mevboost.pics*
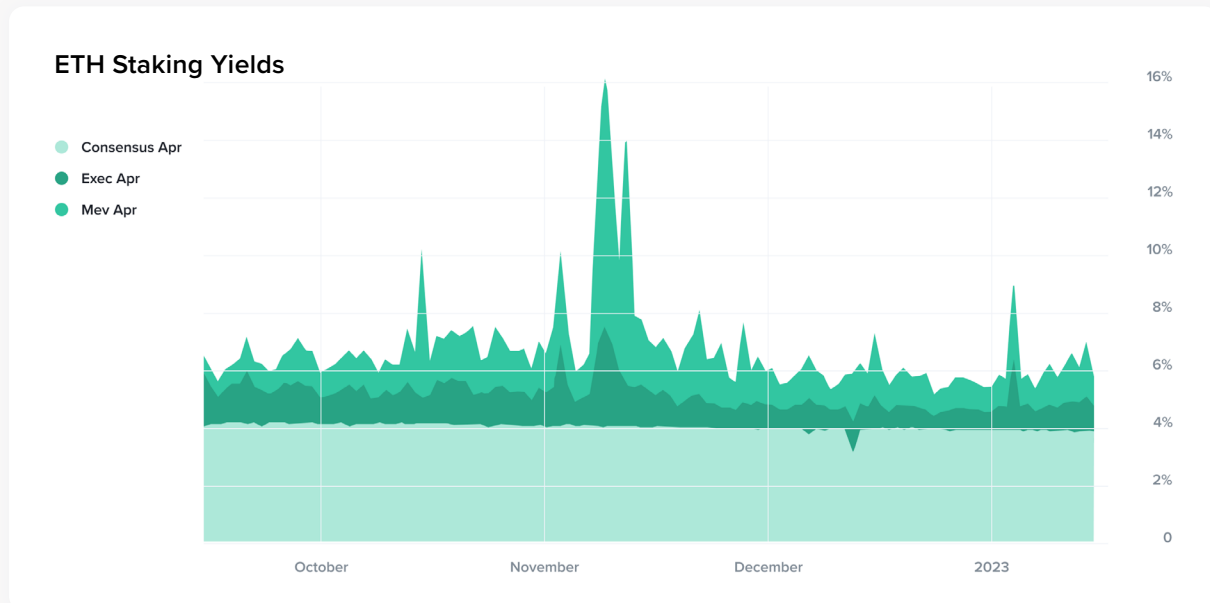
Source: *Parsec.finance*

An emerging trend toward centralization

The success of liquid staking raises concerns

Another crucially relevant part of Ethereum is liquid staking. Ethereum's lack of unstaking functionality created a compelling use case for liquid staking solutions, whereby a staker receives a receipt token in exchange for staking ETH into a liquid staking pool. That receipt token can be traded or used in DeFi as collateral in place of ETH. Currently, 31% of staked ETH is deposited into Lido's liquid staking protocol. Another 25% is within centralized exchanges Coinbase, Kraken, and Binance, as shown in **the pie chart**.

Lido has succeeded in making its protocol competitive with staking offerings from centralized exchanges, but its success in capturing the liquid staking market has meant that it has become a potential centralizing force. Still, Lido's delegation of Ethereum to 30 node operators ensures that it remains a more decentralized alternative than a single exchange.

More decentralized liquid staking protocols like **Rocketpool** or **StakeWise** have struggled with onboarding node operators in order to stake incoming ETH, but the recently added withdrawal functionality enabled by Ethereum's **Shanghai Fork** is sure to shake up the liquid staking industry dynamics.
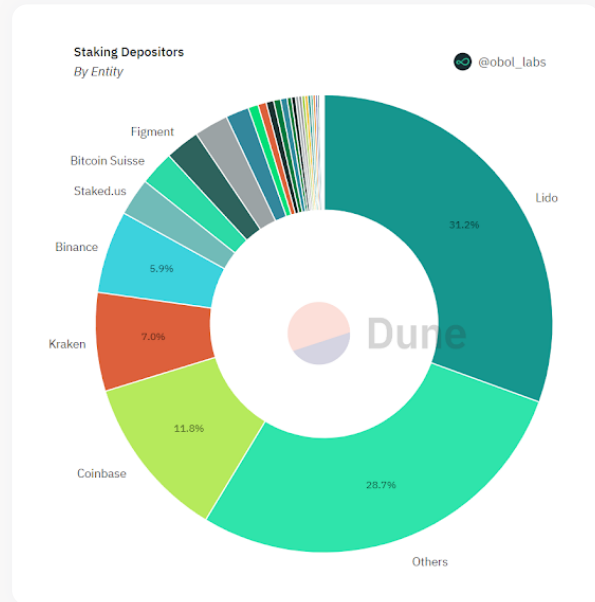

Source: *Dune.com*

Centralized staking services, on the other hand, face a renewed regulatory **headwind** as the SEC recently **forced** the exchange Kraken to discontinue their staking program and pay $30m. This has prompted industry-wide push-back, including from other centralized exchanges like **Coinbase**. Over the long term, this may prompt stakers to migrate to more decentralized offerings, or it may stall the growth of staking altogether.

Validator decentralization remains a mixed bag

While blockchains like Ethereum do not limit the number of validators, this is not the case for most blockchains. Blockchains like Mina, with no limit, see the number of validators fluctuate but generally trend upward, with **335** active validators on Mina. But it's more common to see blockchains set a limit on the number of active validators. On Cosmos chains, this number is limited to those with the most stake: Agoric has **100** validators, Axelar has **70**, and Injective has **60**. Meanwhile, blockchains like
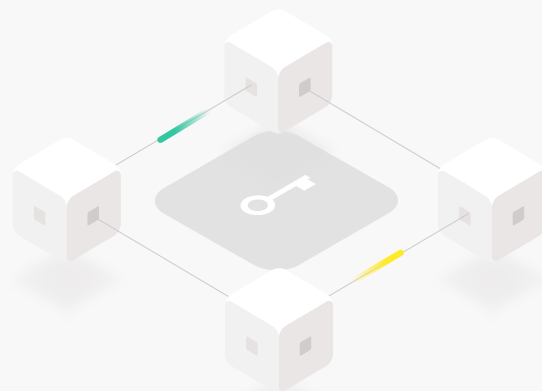
NEAR blockchain take a slightly different approach, defining a minimum number of tokens called the "seat price" that a validator must have staked to become active - this currently results in **212 active validators** on NEAR.

Blockchains that limit the number of validators struggle to achieve broad decentralization. A smaller number of staking providers capture a larger share of staked assets, creating a barrier to entry for new validators. Over time, **very large validator companies** have emerged, staking billions of dollars of assets across many chains.

Blockchains themselves do not offer incentives to validators for adding diversity to the network, nor penalties to those contributing to its centralization. Geographically, validator infrastructure is heavily concentrated in the US and EU, causing concern due to the ever-shifting regulatory landscape. Shown below is the concentration of Ethereum nodes.
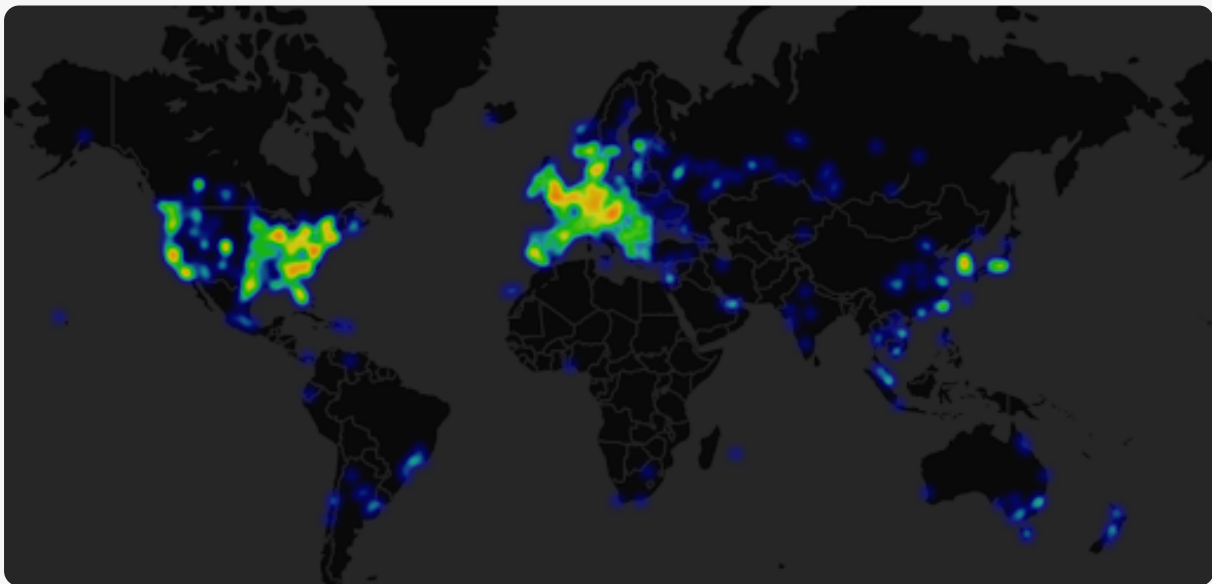
Global distribution and density of staking nodes. Data via **nodewatch.io**

An overreliance on hosting providers is happening on many blockchains. For example, Observatory. zone shows the Cosmos chains Agoric, Axelar, and Injective all having the top 33% of stake concentrated on providers in less than three countries and two hosting providers, as visualized below.


Source: *Observatory.zone*

Validators choosing to run infrastructure as cheaply as possible typically end up on cloud hosting providers like AWS and Hetzner. As a result, blockchain networks have become increasingly reliant on hosting providers: **64% of Ethereum nodes are run via hosting**, of which **70% are hosted by**

Amazon. This means that **a full 45% of Ethereum nodes are hosted on AWS servers**, as shown below. Hosting providers are not always friendly to blockchain customers, as evidenced by **Hetnzer's ban** and eventual **shutdown** of one-fifth of all of Solana's validators in a single day.
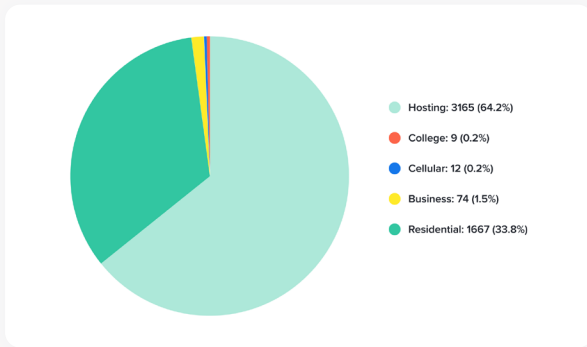

Source: *Ethernodes.org*
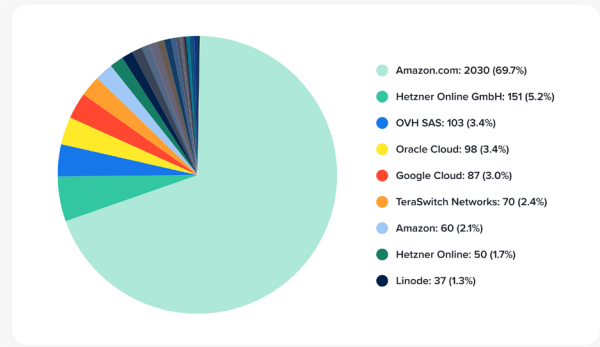
As visualized in the graphic below, **a Stakingrewards survey** showed that while validators currently host across physical and cloud servers, they anticipate a growth in physical hosting going forward.

Large liquid staking protocols like Lido on Ethereum can directly influence the makeup of their validator sets, and thus the decentralization of the overall network. Lido has attempted to select a diverse set of **node operators**. On blockchains with delegated staking functionality like Near, liquid staking protocols like Meta Pool auto-delegate the pool's stake to **hundreds of validators** depending on each validator's performance and decentralization, significantly improving the diversity and decentralization of the NEAR network.

Whether at the hands of large retailers or global cloud service providers, staking service centralization is on the rise. Ethereum continues to command a large share of the Proof-of-Stake market, with many of the other chains offering little to no incentives for validator diversity. Liquid staking solutions are also a contributor to stake concentration, by the nature of their pooled staking offering.

In this climate, however, several specialist solutions are emerging. In the following section, we discuss some of the ways in which providers can contribute to network health and advance decentralization.
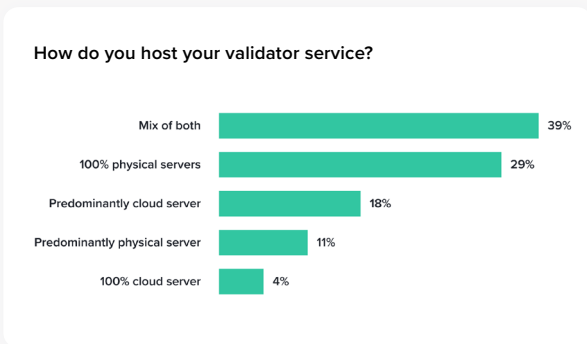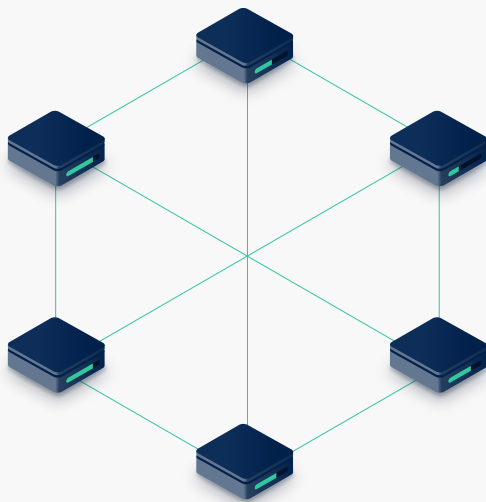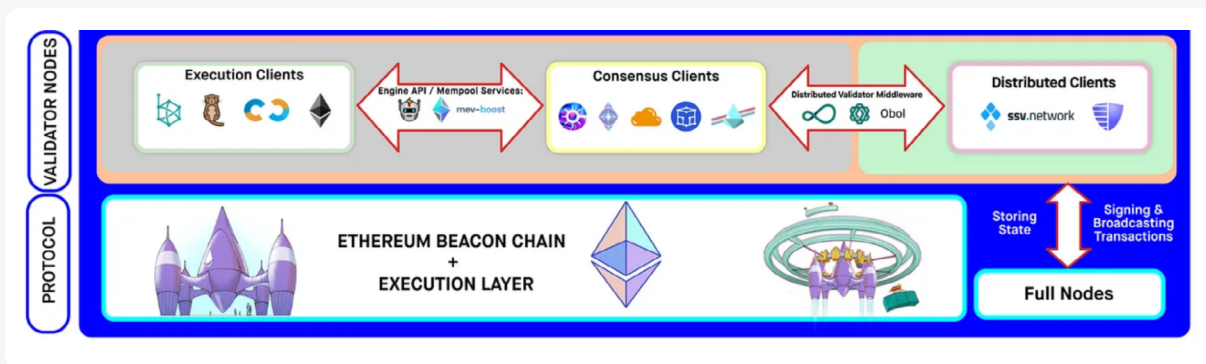

Source: *Stakingrewards*
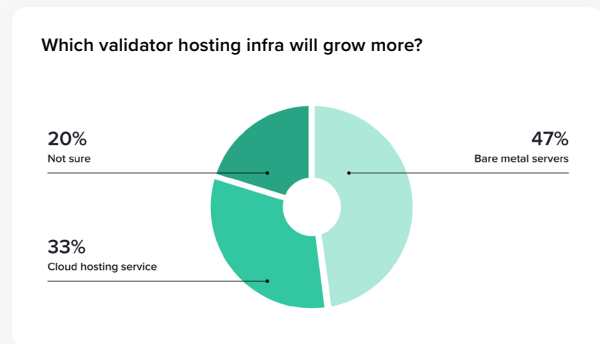
PART II

The emergence of specialists

Since centralization has been on the rise for some time, technology providers have emerged that focus on solving centralization issues. These include improving collaboration among infrastructure providers, boosting network efficiency, negotiating regulated agreements for service provision, and facilitating access for smaller players.

Validator operators can contribute to network decentralization in a variety of ways, such as by running minority execution or consensus clients or implementing specialized middleware. Among the many specialist staking node technologies, we've noticed three key trends that are seeing notable adoption.

On the validator operations side, **distributed validator technology** (Obol, ssv.network) and **MEV-boost software** (Flashbots, BloXroute) are both recognizable in the industry by now. More broadly, in the DeFi space, **liquid staking pools** (open, like Rocketpool, with a limited number of validators, like Lido, or curated, like Stakewise) have also been gaining popularity.


Validator node middleware developers on Ethereum are becoming increasingly sophisticated. Diagram via **StakingRewards**.

For a closer look at the impact of specialist staking solutions, we spoke with **Brett Li** from Obol Labs and **Jordan Sutcliffe**, from StakeWise, who tell us more about what they have encountered in their work on Ethereum.

Just like we observed from analyzing the numbers in the previous section of this paper, Sutcliffe also remarked that

❝ There has been a clear centralizing trend over the past few years due to two factors: the popularity of staking with centralized exchanges, and the dominance of Lido as a liquid staking protocol. This led to ~60% of the Ethereum stake being controlled by four players towards the end of 2022."
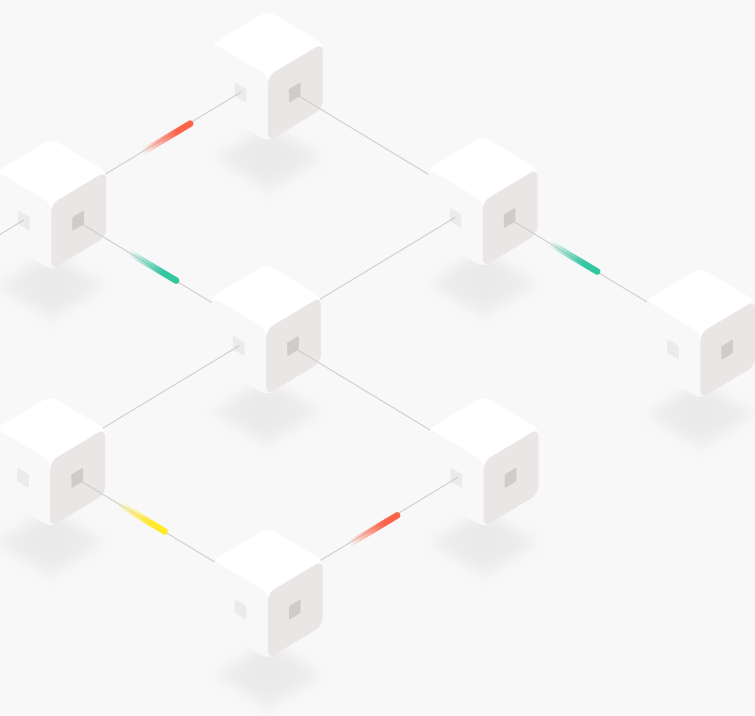
On the other hand, it does appear that the industry is trying to grapple with the pressure of looming centralization, with specialized solutions aiming to tackle this challenge. As Brett Li explains,

❝ Liquid staking protocols are gaining traction with decentralized specifications, with the likes of Rocket Pool, StakeWise V3, Lido V2, - all examples of specs embracing a modular approach, where the user has increased decision power over how validator nodes are set up, and with DVT as a central element in the design of these specs. Staking education and in-depth guides are also contributing to the lowering of technical barriers for staking, with plug-and-stake hardware such as Dappnode and Avado gaining momentum."

As the industry moves forward, it's important to carefully consider the risks and opportunities for Ethereum staking after the Shanghai upgrade. While enabling the functionality to withdraw assets for validators might make the network more attractive to institutional investors, questions about network health remain unresolved. According to Li, "the entire Ethereum ecosystem must continue to strive toward decentralization to reduce correlated risks in the network."

While institutional capital can be a centralizing force, it is also one of the key enablers of mass adoption. In the institutional space, clients need to trust that their stake is secure and can be inspected or even withdrawn at any given time. But, as Sutcliffe relates, "There is a conflict of interest between node operators, who want to keep validators running to earn revenues, and stakers who might want to unstake at any time."

In the case of anonymous validator operators, there is no simple way to keep them accountable for the stake deposited with them through direct delegation. Non-anonymous operators like Finoa Consensus Services implement service-level agreements that disclose the exact terms of the delegation, ensuring assets are protected. "Institutions must be able to guarantee access to their staked capital upon request and it is of paramount importance that operators are unable to hold their assets hostage," adds Sutcliffe.

To improve the health of the industry it is crucial to ensure that assets are protected, and operators are held accountable for the stake deposited with them through direct delegation or service-level agreements. As the crypto asset market continues to evolve, it is essential to remain vigilant and consider the risks and opportunities brought by new technical and regulatory developments. In the next section of this paper, we review the most important criteria that institutions must consider when working with staking validator operators.

STAKEWISE

Jordan Sutcliffe
Head of Business
Development at StakeWise

What problem are you solving?

StakeWise V3 solves numerous problems, of which capital pooling and decentralization are key priorities.

Commingling assets across various jurisdictions and from entities with differing regulatory standards is problematic. It's important that assets can be segregated into isolated staking pools, removing the need for regulated capital to be commingled.

How does it work?

StakeWise allows anyone to access liquid staking on their own terms, from solo stakers to regulated institutional and retail entities, who must liquid stake in a compliant manner.

Stakers can decide whom to pool capital with, cherry-pick node operators, and even negotiate bespoke commercial agreements with operators.

As a white-label solution, Stakewise allows any entity that offers ETH staking to leverage its architecture to build its own staking solution, plugging into the ready-made liquid staking ecosystem of StakeWise.

◯◯ Obol

Brett Li
Head of Growth
at Obol Labs

What problem are you solving?

There is no way today to operate validators in a high-availability environment without introducing slashing risk. That is because each validator acts as a single entity with its individual private key.

The high barriers to entry for operating a validator also lead to a natural centralization of stakes in the ecosystem.

How does it work?

Distributed Validator Technology (DVT) improves decentralization in Ethereum by allowing multiple operators to act as a single validator on Ethereum, mitigating stake centralization risk.

With DVT, a cluster of nodes run by an individual, group, or community of operators can maintain fault tolerance as long as a certain threshold of active nodes is met (i.e. 3 of 4, 5 of 7, etc.).

DVT thus increases resiliency by reducing validator downtime and protecting against key compromise. It also lowers the slashing risk of honest validators, notably those running active-passive setups.

Disclosure: Finoa Consensus Services (FCS), the Finoa subsidiary focused on blockchain infrastructure, is running +5300 Validators on Ethereum and Gnosis for the liquid staking platform StakeWise. FCS champions DVT and has successfully tested the Obol Labs DVT solution to improve the fault-tolerance of its Ethereum validators.

PART III

Criteria for choosing staking node providers

Due diligence is required, but transparency is often lacking

Although delegated staking doesn't require giving up custody of assets, there still are risks for stakers. Stakers delegating to staking providers with poorly run infrastructure could face slashing or downtime penalties. Thus, stakers should carry out due diligence on validators and carefully consider their options. This due diligence process can be a significant effort, although websites like *Stakingrewards.com* have established uniform ratings for staking providers.

Reliability and performance

The most important measure of a staking provider's competence is their on-chain performance. By using tools like *Rated.network* for Ethereum, stakers can assess the historical performance of validators and judge their competence and reliability. Generally speaking, a validator should have little to no downtime, and miss almost none of the network consensus votes or attestations.

Commission fee

An obvious factor to consider is the commission fees charged by a validator. This is the percentage of the staking rewards that a validator keeps for themselves. This commission primarily covers the costs of infrastructure and staff.

Location

Another consideration is the location of the validator company and its infrastructure. Stakers may consider the regulatory or tax implications of staking with providers in foreign countries. Thankfully, staking rewards are usually paid directly into the on-chain account containing the staked assets, which simplifies accounting.

FROM CEFI TO DEFI: HOW STAKING IS SHAPING THE CRYPTO INVESTMENT LANDSCAPE

Infrastructure

Stakers may not have strong opinions on infrastructure, but should expect staking providers to be transparent about the type of infrastructure they use. At a minimum, providers should indicate whether they run their infrastructure on-premises, or in the cloud. Stakers should also consider that, by refusing to stake on cloud infrastructure, they are decentralizing the network and increasing its value.

Engineering expertise

A professional staking provider will have a team of experienced DevOps engineers, who can maintain a 24/7 on-call schedule. Consider the size of the team versus the number of blockchains for which staking is offered. A large number of blockchains run by a small team can indicate an overworked staff that is more prone to mistakes or oversights. A company's open job positions can also indicate a staff shortage, and which areas of the business are growing.

Support for "blue chip" networks

Another easy way to assess the legitimacy of a staking provider is by judging the quality of the blockchain networks for which they provide infrastructure. A staking provider that runs on several well-known blockchains is generally more legitimate than one running on smaller and more obscure networks.

Support for new technologies

Like any business, validators are vulnerable to disruption from new technology. With advancements like distributed validator technology (DVT) quickly becoming the norm, staking providers that do not gain experience and upgrade their offerings will become less useful and relevant.

Degree of decentralization

Many staking providers have an economic interest in retaining their market share, which is often in conflict with the decentralization of networks. Look for signals that a staking provider truly supports decentralization. This means doing the right thing for blockchain networks, even at the cost of short-term revenue. By improving the decentralization of blockchain networks and improving staking offerings, more assets will become staked, which benefits investors and the industry as a whole.
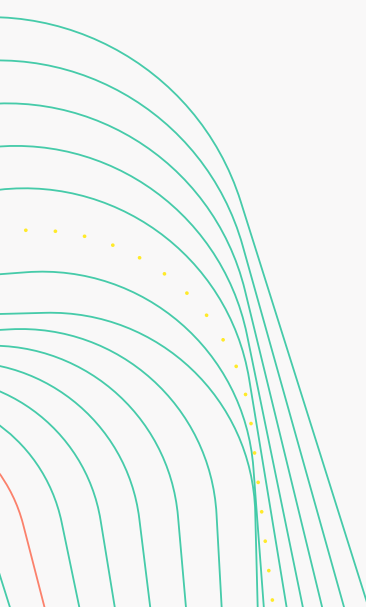
Conclusion

In this report we first looked at the recent growth of the staking industry, whose size is directly related to the market capitalization of PoS assets. We reviewed how Ethereum's MEV provides validator rewards as a result of the on-chain activity. Aided by blockchains' limited validator sets, some staking providers have grown dominant, including some non-custodial validator companies, centralized exchanges, and liquid staking protocols.

Liquid staking protocols offer a compelling alternative to centralized staking offerings, especially on Ethereum. But Lido's success has seen it become a potentially centralizing force. The trend of liquid and non-custodial staking may be further catalyzed by the recent regulatory crackdown on centralized staking offerings.

Decentralization of validators and networks remains a mixed bag, with a lack of incentives for infrastructure decentralization leading to a dominance of US and EU-based cloud infrastructure. As liquid staking protocols gain stake and importance, they can play a role in improving the decentralization of underlying blockchain networks.

Participation in PoS is enabled differently by different providers, each with its pros and cons. These offerings include non-custodial staking-as-a-service providers and custodial offerings from custodians or exchanges. Stakers should research and consider factors including the staking provider's commission fees, location, infrastructure and team, and support for new technologies. Ultimately, on-chain performance and reliability are the most compelling metrics of a staking provider's competence.

About Finoa

Finoa is a European qualified custodian, enabling institutional access to the ever-growing crypto asset ecosystem, with industry-leading asset coverage and day-one support for emerging blockchain protocols and in-demand projects.

Finoa offers institutional investors a full range of financial services including custody, staking, and brokerage. Its intuitive platform enables users to securely store and manage their assets regardless of their familiarity with crypto.

As a qualified custodian licensed by the German Federal Financial Supervisory Authority (BaFin), the company serves high-profile clients from around the world, including renowned VC firms, crypto hedge funds, Web3 companies and foundations, and professional investors.

Christopher May and Henrik Gebbing co-founded Finoa in Berlin in 2018 and the company is backed by financial investors Balderton Capital, Venture Stars, Coparion, and Signature Ventures.

For media releases and more information, visit Finoa's **website** or get in touch at **hello@finoa.io**