ESN Protocol

Re- pledge protocol based on Ethereum

white paper

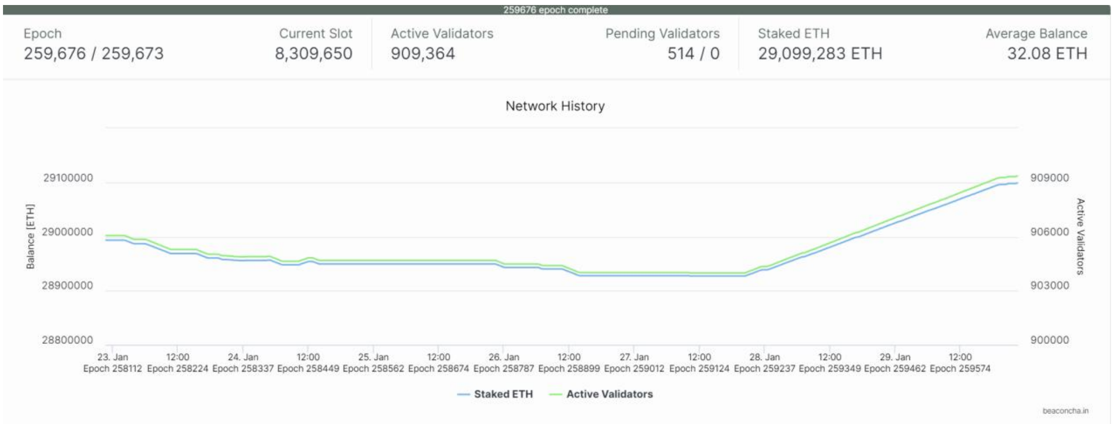
Table of contents

1. Overview and market background

1.1 Ethereum staking boom

Since Ethereum was upgraded from POW to POS and upgraded in Shanghai, the Ethereum staking market has ushered in a wave of sustained growth, bringing new impetus to the entire ecosystem for vigorous development.

to data from beaconcha.in, as of December 2023 , the total pledged amount of Ethereum has exceeded 29,009,283 ETH , continuing to show an upward trend . This trend not only reflects investors' optimism about the future development of Ethereum, but also marks the increasing importance of the staking mechanism in the Ethereum ecosystem.



Data from beaconcha.in (Beacon Chain Browser) shows that after the Shanghai upgrade, the daily new staking volume has exceeded the withdrawal volume most of the time, forming a sustained and strong staking trend. This has also become the largest and longest-lasting Ethereum staking boom since The Merge on September 15, 2022.

The catalyst for this staking craze is confidence in Ethereum's future prospects and the stable returns that staking provides. As the amount of pledged ETH increases, pledgers are not only satisfied with the annualized income, but are also looking for more ways to earn income. The rise of this market demand has created more opportunities for innovation and development in the staking field.

The boom in the Ethereum staking market also reflects investors' increased trust in blockchain technology and the crypto-economy. As the staking market continues to expand, the Ethereum ecosystem will further consolidate its leading position in the blockchain industry and lay a solid foundation for future development. The continuation of this craze will undoubtedly bring more vitality and innovation to the entire Ethereum community.

1.2 Ethereum builds cryptoeconomic trust

as humankind has ever known . From the earliest survival needs, to cooperation in hunting and gathering, to complex social structures, trust has been present throughout all stages of human evolution. Today, trust has evolved into an indispensable element of modern society.

Bitcoin, as the first cryptocurrency, created an infrastructure that took trust away from a central authority or organization and left it to mathematics and game theory to govern. The working principle is that miners compete to package transactions by solving mathematical problems, ensuring the security and transparency of transactions. However, while Bitcoin paves the way for a decentralized trust and payment system, it has certain limitations in terms of programmability.

Ethereum, on the other hand, is based on smart contract technology and provides wider programmability. Ethereum's trust mechanism is based on the behavior of the verifier and ensures the decentralization of the network through the PoS (Proof of Stake) mechanism, allowing users to participate in and create smart contracts more flexibly. This new type of trust bond is not limited to the payment system, but creates a broader development space for the encrypted economy.

In this digital age, the concept of encrypted economic trust is not only a technological innovation, but also a subversion of the traditional trust model. Bitcoin and Ethereum have worked together to build the foundation of trust in the new era and opened a new era of trust.

However, Bitcoin was primarily designed as a digital gold for use as a store of value and cross-border payments. Its smart contract functions are relatively limited and cannot meet more complex business logic. This provides an opportunity for the emergence of Ethereum.

The emergence of Ethereum has greatly expanded the application areas of cryptocurrency. It introduces smart contract technology, allowing users to write and execute programs on the blockchain to implement more complex business logic. The trust mechanism of Ethereum is based on the PoS (Proof of Stake) consensus algorithm. Verifiers participate in the consensus process of the blockchain network by pledging a certain number of tokens.

Smart contracts are one of the core features of Ethereum. They are automated contracts that run on the blockchain and can be executed without the need for an intermediary. This programmability makes Ethereum a decentralized application platform on which users can build various decentralized applications (DApps). From decentralized finance (DeFi) to the non-fungible token (NFT) market, Ethereum provides diverse solutions for the crypto economy.

Encrypted economic trust is not only an innovation in technology, but also a rethinking of the traditional trust model. In traditional societies, trust is mainly provided by government institutions, especially in the economic and legal fields. However, with the rise of cryptocurrencies, people are beginning to put trust back into mathematics and game theory.

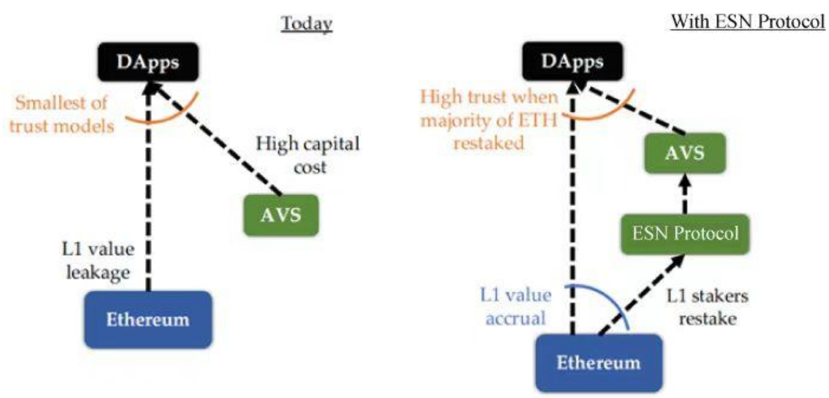
Ethereum’s trust mechanism has given rise to a new trust concept in the digital age: “encrypted economic trust.” This concept breaks through the limitations of traditional trust and enables trust to be achieved in a decentralized manner. Users can trade and cooperate without trusting intermediaries, relying on the execution of smart contracts and the transparency of the blockchain.

However, the biggest problem with Ethereum’s trust machine system is that every application that requires cryptoeconomic trust must build its security from scratch. This can lead to several problems, such as "economic security fragmentation" as each application creates its own economic security. Also, it is impossible for every application to issue tokens, and poorly designed or useless tokens will lead to the inability to build game theory for the network , etc.

1.3 Limitations of the Ethereum network

Any module that cannot be deployed or proven on top of the EVM cannot absorb Ethereum' s collective trust. Such modules involve processing inputs from outside Ethereum , so their processing cannot be verified within the protocol within Ethereum . Examples of such modules include sidechains based on new consensus protocols , data availability layers, new Virtual machines, guardian networks, oracle networks, bridges, threshold encryption schemes and trusted execution environments .

Such modules require actively validating services that have their own distributed validation semantics for validation. Typically , these Actively Verified Services ("AVS") are either protected by their own native tokens or are permissioned in nature.



The current organization of the AVS ecosystem has four basic shortcomings :

1、Bootstrapping issues for new AVS : Innovators looking to develop new AVS must bootstrap a new network of trust for security.

2. Value leakage problem : As each AVS develops its own trust pool , users in addition to paying transaction fees to Ethereum . Fees must also be paid to these pools , and this diversion of fee streams leads to value leakage in Ethereum.

3. Capital cost burden issue: Verifiers who stake to ensure the security of the new AVS must bear capital costs , which is equivalent to the opportunity cost and price risk associated with staking in the new system. Therefore , AVS must provide a high enough staking return to cover this cost.

For most AVS currently operating, the capital cost of staking far dominates any operating costs. For example, consider a data availability tier with $10B of equity protecting it, and assume the stakeholder's expected annual rate of return (APR) is 5%. This AVS needs to repay at least $0.5B to the pledgers every year to compensate for the capital cost. This is significantly higher than the operational costs associated with data storage or network costs.

4. The trust model of DApp is low. The current AVS ecosystem has led to an unwelcome security dynamic, where typically any middleware dependency of a DApp can become a target for attack. Therefore, the cost of compromising a DApp must generally be considered to be no more than the minimum cost of compromising at least one dependency. In the case where an application relies on a critical module (such as an oracle) and protects its operation with a small amount of stake, the strong economic security provided by Ethereum may seem meaningless, because the cost of attacking the oracle is much lower than attacking the oracle. potential losses caused.

2. Project introduction

2.1 Basic concepts of ESN Protocol

ESN Protocol (Ethereum StakeNet) is an innovative Restaking protocol based on Ethereum. Its core mechanism allows ETH and various types of LST to be pledged again on the protocol or chain and participate in its verification process. Using LSD assets as collateral, we provide convenient and low-cost AVS services to AVS demand parties such as middleware, application chains, and Rollup, thus significantly improving the security of the confidential economy. Users can use this protocol to perform heavy staking operations on Ethereum and re-pledge the ETH pledge node certificate Lst. This agreement not only reimagines the staking mechanism, but also contributes to the future development of the entire Ethereum cryptoeconomic system, improving It improves the entire ecological network security and asset liquidity of Ethereum.

2.2 Vision of ESN Protocol

ESN Protocol 's vision does not stop at the staking field, but is based on redefining the participation and reward model of the Ethereum ecosystem. We are committed to building a staking platform with profound economic significance, providing users with wider participation opportunities and more generous rewards, and promoting the prosperity of the entire ecosystem.

ESN Protocol believes that staking is not only about locking digital assets in smart contracts, but also a way to actively participate in network governance. By staking, users become part of the network's consensus mechanism, contributing to the security and sustainability of the entire ecosystem. We are committed to communicating the profound economic significance of staking so that users realize that the contributions they make benefit not only their individual assets, but the entire Ethereum network.

We view users as core participants in the ecosystem. Through a rich reward mechanism, we encourage users to actively participate in staking activities, and create an open, inclusive, and collaborative community environment through community building. What we pursue is not only digital rewards, but also building a dynamic and creative community together to provide every member with opportunities to learn, grow and connect.

2.3 Features of ESN Protocol

1. Flexibility of remortgaging

ESN Protocol gives users greater flexibility in the Ethereum crypto-economy by re-staking their tokens. Users can re-stake native ETH, LSDETH and LP Token through smart contracts and receive verification rewards. This mechanism enables users to obtain more rewards while maintaining the security of the ETH main network, achieving a win-win situation between staking and rewards.

2. Ethereum-level security

ESN Protocol provides Ethereum-level security for the entire Ethereum cryptoeconomic system in the future. Through its close connection with the Ethereum network, ESN Protocol directly leverages the security of Ethereum to provide users with reliable protection. The level of security brought by this integration is the pinnacle of the entire cryptoeconomic system, providing solid protection for users' assets.

3. A win-win ecosystem

ESN Protocol not only focuses on the interests of users, but also builds a win-win ecosystem. Third-party projects can enjoy the security of the ETH mainnet and receive additional rewards under the framework of ESN Protocol . The construction of this ecosystem not only provides users with more participation opportunities, but also provides support for the sustainable development of the project.

3. ESN Protocol re-pledge

ESN Protocol enables pooled security through re-collateralization and free market governance, which helps extend Ethereum' s security to any system and eliminates the inefficiencies of existing strict governance structures .

3.1 Pooling security through recollateralization

ESN Protocol provides a new pooled security mechanism that enables modules to be secured with re-staking ETH , rather than their own tokens. In particular, Ethereum validators can set their beacon chain withdrawal credentials to ESN Protocol contracts and choose new modules built on ESN Protocol .

Validators download and run any additional node software required by these modules , which then have the ability to impose additional slashing conditions on the ETH staked by validators who opt-in to the module , a mechanism we call re-staking. In return validators can earn additional income for providing security and verification services to the modules of their choice. When combined with an on-chain verifiable slashing mechanism, this re-collateralization mechanism enables deep transfer of cryptoeconomic security .

As such, ESN Protocol extends open innovation beyond smart contract-based DApps supported by Ethereum to virtual machines, consensus protocols and middleware. Any AVS contract with on-chain slashing capabilities can be guaranteed by ESN Protocol .

3.2 Opening the market

ESN Protocol provides an open market mechanism to manage how pooled security is provided by validators and consumed by AVS. ESN Protocol creates a market where validators can choose whether to join or exit each module built on ESN Protocol . Various modules need to fully incentivize validators to allocate re-mortgaged Ether to their modules and validators . To help determine which modules are appropriate to take into account the possibility of additional cuts, allocating additional set security is worthwhile.

ESN Protocol ' s opt-in dynamic has two important benefits:

(1) The stable and conservative governance of the core blockchain is supplemented by the structure of fast, efficient, free market governance to launch new auxiliary functions;

(2) Opt-in verification allows new blockchain modules to leverage heterogeneous resources among validators , thus better aligning the trade-off between security and performance.

3.3 Solving problems in the AVS ecosystem

ESN Protocol becomes an open marketplace where AVS can centrally lease the security provided by Ethereum validators. ESN Protocol will be able to solve the various problems in the AVS ecosystem highlighted above :

```
pragma solidity ^0.4.24;

// ----------------------------------------------------------------------------
// Sample token contract
//
// Symbol        : LCSTK
// Name          : {{Token Name}}
// Total supply  : {{Total Supply}}
// Decimals      : {{Decimals}}
// Owner Account : {{Owner Account}}
//
// Enjoy.
//
// (c) by Juan Cruz Martinez 2020. MIT Licence.
// ----------------------------------------------------------------------------
```

(1) Bootstrapping issues with the new AVS : The new AVS can bootstrap security from Ethereum’s large validator set.

(2) Capital cost : Because ETH stakers reuse their capital across multiple services , their capital cost is amortized. In particular, the marginal cost of capital for local ETH stakers who choose to join ESN Protocol is small .

(3) Trust aggregation : Since the re-staking pool is larger , the trust model is much better. For example : assuming all L1 pledges are re-staking to all three AVS modules, the cost of destroying the DApp is the total amount of L1 itself pledged. We note that due to the additional yield opportunities of the three AVS , the total amount staked in L1 in the presence of ESN Protocol is now equal to the individual amount staked in L1 and every AVS in the world without ESN Protocol .

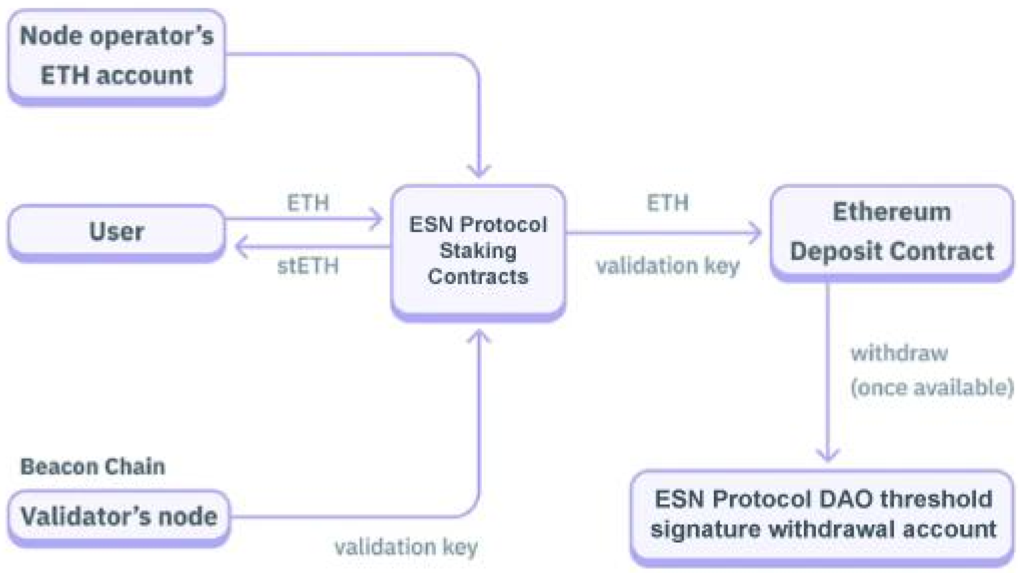
(4) Value accumulation : ESN Protocol provides ETH stakers with several additional revenue streams that they can participate in , further solidifying the ecosystem’s network effects due to the existence of the highly secure AVS ecosystem.

4. Support multiple pledge modes

4.1 Liquid pledge

ESN Protocol ’s Liquid Staking Service allows users to deposit their ETH into a staking pool and receive Liquid Staking Tokens (LST) representing their ETH and its staking yield.

In a staking pool, ETH is delegated to one of the many validators participating in the consensus protocol. After the Shapella upgrade , LST will be redeemable at its base ETH value, but redemptions will be subject to the same waiting period as the ETH pledge withdrawal period. LST can also be traded in the DeFi ecosystem through exchanges such as Uniswap and Curve.



4.2 Superfluid Pledge

Superfluid Staking works by modifying the core consensus protocol to reverse the order of liquidity staking to allow staking of Liquidity Supply (LP) tokens. LP tokens represent a portion of the total liquidity contained on DeFi exchanges such as Uniswap or Curve.

ESN Protocol provides a variety of income stacking methods, allowing stakers to obtain additional income by obtaining new AVS. Broadly speaking , we can think of three different layers of blockchain : Core Protocol, AVS, and DeFi.

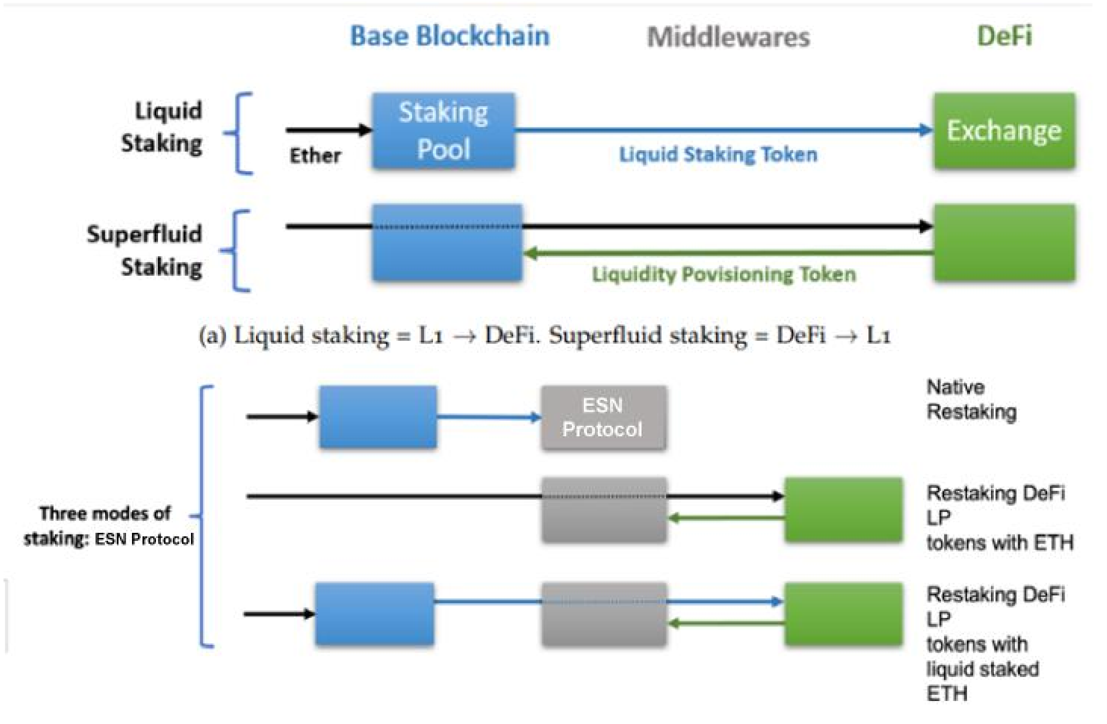
Liquidity staking can be thought of as stacking returns by first entering the core protocol and then the DeFi layer. Superfluid staking can be thought of as first passing through the DeFi layer before entering the core protocol layer.

4.3 Various re -stakings of ESN Protocol

(1) Native re-staking : Validators can re-stake their staked ETH by pointing their withdrawal credentials to the ESN Protocol contract. This is equivalent to L1-ESN Protocol yield stacking .

(2) LST re-staking : Validators can re-stake by staking their LST , ETH has been re-staking through the ESN Protocol protocol , transferring their LSD to the ESN Protocol smart contract. This is the equivalent of DeFi → ESN Protocol yield stack.

(3) ETH LP re-staking : The verifier pledges a pair of LP tokens including ETH. This is quite a dry DeFi → EL yield stack.



(4) LST LP re-pledged. Validators stake LP tokens in a pair , which includes liquidity-staking ETH tokens , such as Curve' s stETH-ETH LP tokens, thereby taking L1 →DeFi → EL yield overlay route.

Each avenue comes with different types of risks. In keeping with the principle of opt-in governance , ESN Protocol outsources the management of such risks to module developers. Developers choose which tokens they accept as equity in their AVS. They can also choose whether to have priority weighting in rewards allocated to different types of staked tokens. For example, a module primarily interested in decentralization might only accept re-staking in the form of native re-staking ETH.

4.4 stETH rewards

StETH stakers will receive daily rewards through stETH balance adjustments. There is no activation period because ESN Protocol ' s staking rewards are distributed to all stakers. All stETH holders, including new depositors, can receive staking rewards through daily stETH balance adjustments. This means that the rebase affects all stETH holders regardless of whether their ETH is deposited into the validator queue , which is how it works. If only a portion of ESN Protocol validators pass the queue, all existing stETH holders, including new depositors, will receive rewards from the queue. This results in a potentially lower initial reward rate compared to Ethereum, as rewards received by a small number of accepted validators will be distributed proportionally to all stETH holders.

$$\delta_i = \sum_{EAR=1}^{m} Q_{EAR} = \sum_{EAR=1}^{m} L_{EAR} CM_{EAR} CN_{EAR} CR_{EAR} NR_{EAR}$$

$$CM_{EAR} = \frac{\sum n1 + n2 + n5}{\sum n1 + n2 + n3 + n5}$$

$$CR_{EAR} = \frac{\sum n1}{\sum n1 + n2 + n4 + n5}$$

$$CN_{EAR} = 1 - \frac{\sum n5}{\sum n1 + n2 + n4 + n5}$$

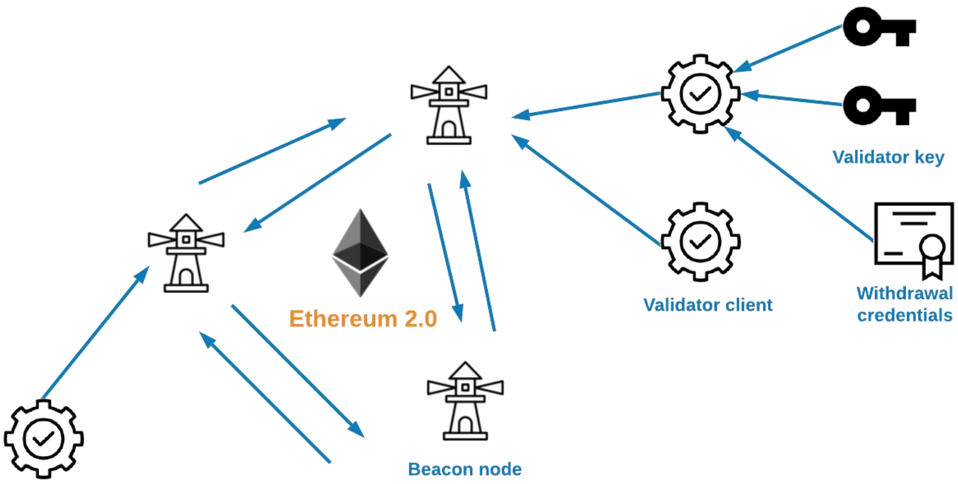
$$P(D \leq n-m) = e^{-\lambda} \sum_{i=0}^{n-m} \frac{\lambda^i}{i!}$$

Liquidity staking your Ethereum with ESN Protocol allows you to maximize your ETH staking returns through risk diversification, MEV, and professional node operator selection. Typically when staking ETH you can operate a validator or just choose an operator. With ESN Protocol , you can stake across multiple node operators, minimizing your staking risk. This is because staking with a single operator may carry the risk of lower returns or losing some of the staked ETH if validators are slashed for any reason. By staking across multiple node operators, you can spread your risk and minimize the impact of reward reduction or slashing events. Not only are your interests spread across operators, but they are also located in different geographies, running different infrastructure and using different clients (such as Prysm, Teku, Lighthouse and Nimbus), which further enhances diversity and network decentralization. Centralization.

ESN Protocol also uses MEV to boost rewards. Here' s how ESN Protocol works , the MEV-Boost architecture enables validators to outsource block construction to third-party block builders. Builders create blocks from available transactions or bundles and send their bids to the relay. The bid contains a value and a block header with no transaction. The MEV-Boost client running alongside the validator collects possible bids from the relay, selects the bid with the highest value, and blindly signs it. The signed block is sent to the builder, who reveals the contents of the payload and propagates the block. This process allows validators to earn higher rewards, which are passed on to stETH holders through daily balance adjustments.

五、Technical details

5.1 Ethereum 2.0 pledge operation



- The beacon node is somewhat similar to the Ethereum 1.0 full node, responsible for forming a peer-to-peer transaction network. Beacon nodes also handle attestations from validator clients. The beacon node itself does not perform staking.
- Validator clients are somewhat like miners. A validator client connects to a single beacon node. Validator clients need to allocate at least 32 ETH to participate in the block creation process and receive block rewards.
- A validator client can be assigned multiple stakes (also called validation keys). There is no need to set up a separate physical server process for each new stake of 32 ETH.
- To bootstrap the staking network, ETH 1.0 can be deposited into the Ethereum 2.0 deposit contract . This ETH will be permanently locked and staked until the

Ethereum 2.0 network matures and transfers can be made. Any accrued Ethereum 2.0 staking rewards are calculated from the Ethereum 2.0 public key and represented by the withdrawal voucher in the deposit contract. When Ethereum 2.0 arrives, anyone who controls the withdrawal credentials key will have full control over ETH.

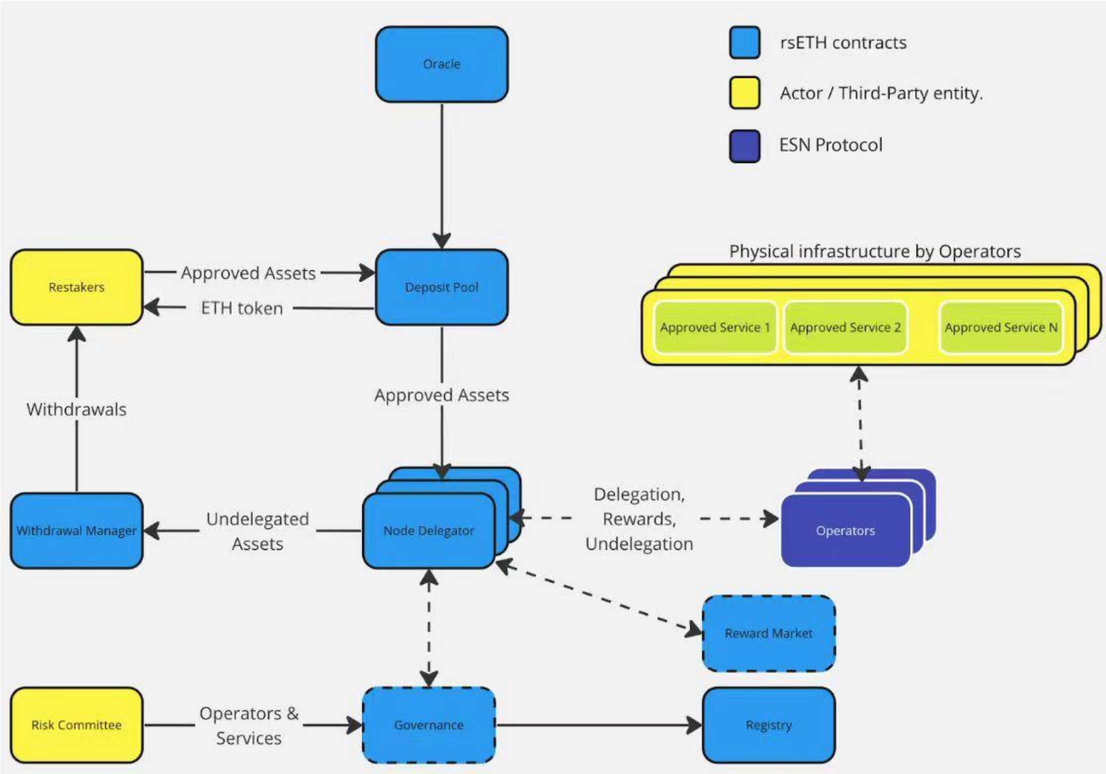
5.2 Unpledge/withdrawal of assets

Assets will be de-delegated from the operator to the node delegator contract and then passed to the withdrawal manager to ensure the correct proportion of the assets is passed to the user.

Various other modules support the main process.

- Registry: All operators, services and assets of the ETH ecosystem will be registered on the registry module. This module also stores metadata related to these entities as well as some key core properties of ETH
- Oracle: This module will be used to push real-time prices of supported assets to the ETH contract. The exchange rate set with the help of these live prices will help mint and burn the right amount of ETH for deposits and redemptions respectively. Governance: A set of contracts that convert successful proposals into executable code to change the behavior of smart contracts.
- Rewards Market: This module will be able to use non-ETH rewards for different additional yield strategies. As AVS explodes, this module will become the base layer for optimizing and evaluating the risk of different governance and utility

tokens earned as rewards.



5.3, stTokens

For ETH pledged in ESN Protocol , the ESN Protocol protocol will provide users with stETH equal to the pledged amount. In order to make DeFi integration easier, stETH has a non-resettable value-added counterpart, referred to as wstETH. ESN Protocol ' s ERC-20 compatible stToken is widely adopted in the Ethereum ecosystem:

(1) The most important on-chain liquidity venues include:

- stETH/ETH Liquidity Pool on Curve
- wstETH/ETH composable stable pool on Balancer v2
- wstETH/ETH pool on Uniswap V3

(2) wstETH is listed as a collateral token on the following AAVE v3 markets:

- Ethereum mainnet
- arbitration
- optimism
- polygon

(3) stETH is listed as a mortgage token in the AAVE v2 Ethereum mainnet market

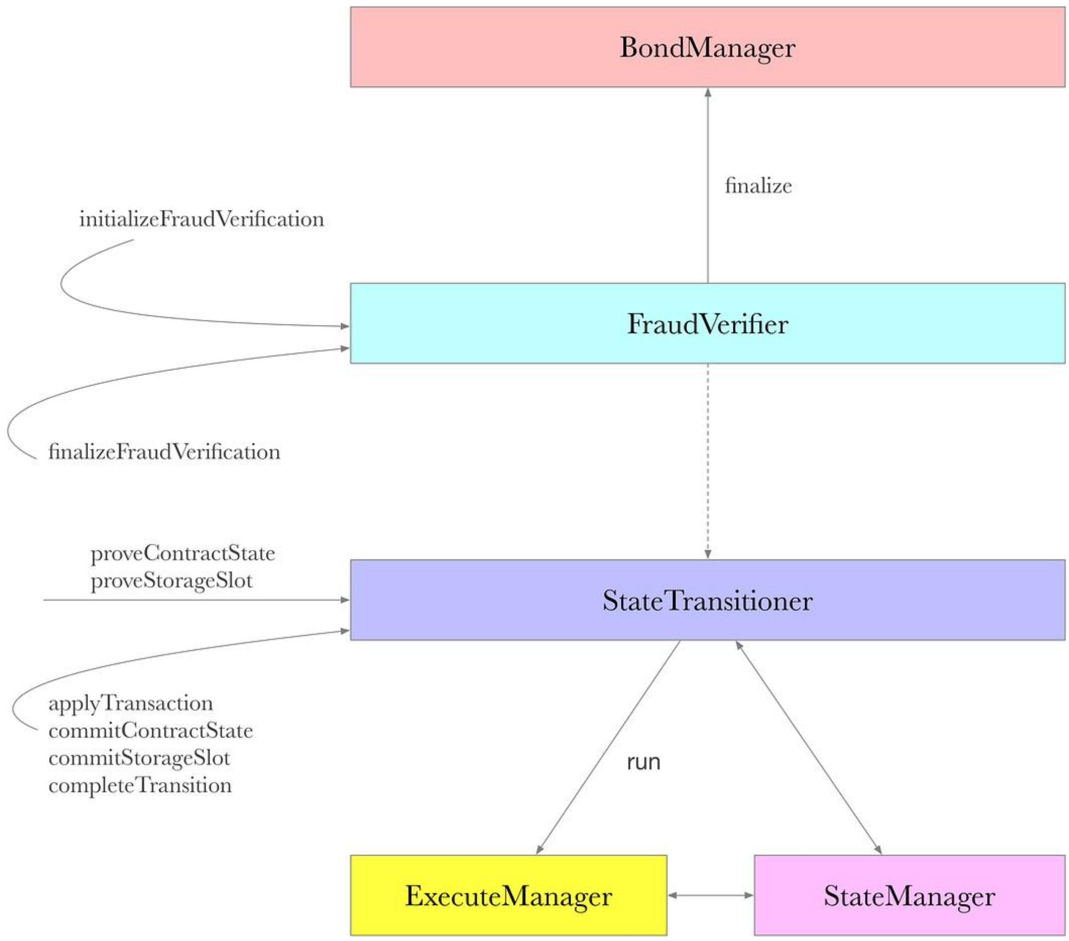
(4) wstETH is listed as a collateral token on Maker

(5) steCRV (Curve stETH/ETH LP token) is listed as a collateral token on Maker

(6) Multiple liquidity strategies are built on top of ESN Protocol’s stToken, including Yearn and Harvest Finance

5.4 Polynomial Commitment

Polynomial commitment is an important concept in cryptography, especially in the fields of zero-knowledge proofs and blockchain. When discussing polynomial commitments, we usually deal with two main types of polynomial commitments, one of which is a commitment based on a single polynomial.



- single polynomial commitment

Single polynomial commitment is a method of ensuring the integrity and immutability of data by committing the coefficients of a polynomial. This means that when we want to pass or verify the value of a polynomial, we can prove the exact value of the polynomial by providing a promise.

- Polynomial Commitment in ESN Protocol’s Algorithm

ESN Protocol’s algorithm uses a special polynomial commitment method that requires two random messages, provided by the Verifier Predictor (Vpc). This approach is more complex than a single polynomial commitment, but it has important advantages in some applications. By using two random messages, ESN

Protocol's algorithm enhances its commitment to polynomials, improving security and privacy.

- Applications of polynomial commitments

Polynomial commitments play a key role in zero-knowledge proof systems, especially in protecting data privacy while verifying its integrity. This is especially important in blockchain technology, as it allows secure transactions and smart contract execution in decentralized networks.

The principle is very simple: (cm-si) + z*(cm-si)/(xz) = x/(sz)*(cm-si).

(a) $\mathrm{V_{PC}}$ sends random $\gamma\,\gamma', \in \mathbb{F}$.

(b) $\mathrm{P_{PC}}$ computes the polynomials

$$h(X) := \sum_{i=1}^{t_1} \gamma^{i-1} \cdot \frac{f_i(X) - f_i(z)}{X - z}$$

$$h'(X) := \sum_{i=1}^{t_2} \gamma'^{i-1} \cdot \frac{f'_i(X) - f'_i(z')}{X - z'}$$

and using srs computes and sends $W := [h(x)]_1, W' := [h'(x)]_1$.

(c) $\mathrm{V_{PC}}$ chooses random $r' \in \mathbb{F}$.

(d) $\mathrm{V_{PC}}$ computes the element

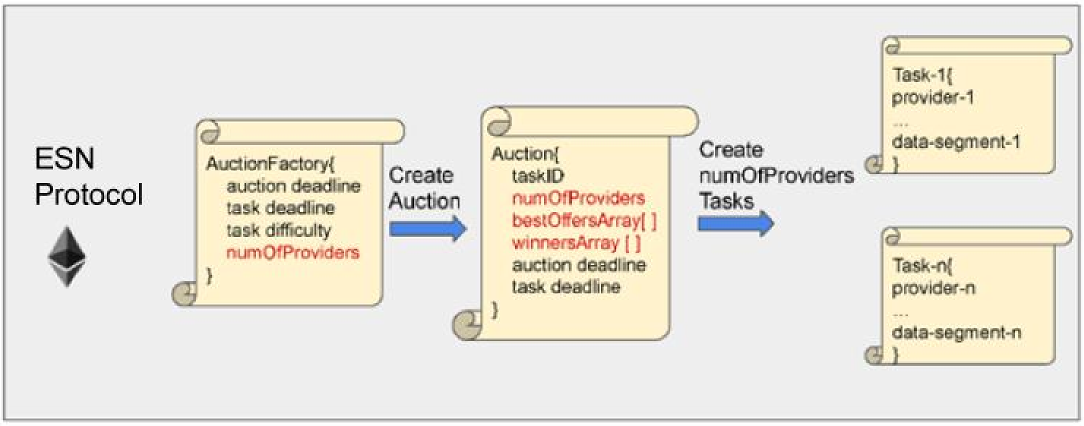
$$F := \left(\sum_{i \in [t_1]} \gamma^{i-1} \cdot \mathsf{cm}_i - \left[\sum_{i \in [t_1]} \gamma^{i-1} \cdot s_i \right]_1 \right) + r' \cdot \left(\sum_{i \in [t_2]} \gamma'^{i-1} \cdot \mathsf{cm}'_i - \left[\sum_{i \in [t_2]} \gamma'^{i-1} \cdot s'_i \right]_1 \right)$$

$\mathrm{V_{PC}}$ computes outputs acc if and only if

$$e\left(F + z \cdot W + r'z' \cdot W', [1]_2\right) \cdot e(-W - r' \cdot W', [x]_2) = 1.$$

5.5 Set up the validator node

To participate in ETH staking as a validator, a validator node must be set up. The process of setting up a node can be challenging and requires a deep knowledge and understanding of the Ethereum network. ESN Protocol provides a seamless solution by simplifying the setup of validator nodes by handling the technical complexities on behalf of our institutional clients. Customers utilizing our ETH staking service can focus on the essentials of staking without worrying about the complexities of node setup and maintenance. Staking is highly secure with ESN Protocol ' s escrow-level protection to keep validator keys safe, and the use of air-gapped wallets for devices not connected to the internet.



- **Place ETH**

The actual first step in the validator lifecycle is to stake ETH . ETH is placed into a staking smart contract, primarily to incentivize commitment to the rules of the protocol. The validator node' s information will then be technically verified before the life cycle continues. This phase usually lasts a few hours while deposits and validator verification are processed.

- **Verification queue**

After the placement phase, validators enter the pending state and are placed in a queue, managing the activation of validators in a fair and orderly manner. This queue helps manage the scalability of the network and prevents an influx of validators that could crash the system. If the queue is empty, pending validators in the queue may become active after approximately 25 minutes. However, during periods of high demand or network congestion, the queue may become longer, resulting in longer activation times for new validators.

- **Active status**

Once validators are activated, they begin fulfilling their duties of enforcing the rules of the protocol and advancing the state of the network in exchange for rewards. Validators in the active phase take turns proposing and generating blocks containing valid transactions in the Ethereum blockchain. Validators also review and verify transactions included in blocks proposed by other validators. In addition to this, validators also perform attestations, which involve voting on the current state of the Ethereum blockchain. Validators in the active phase must remain online at all times and meet the network's requirements, or they may be penalized. Validators will remain in the active phase unless they decide to voluntarily exit or be slashed.

ESN Protocol prioritizes top-tier availability and security of dedicated nodes to avoid potential penalties and risks, with 24/7 node monitoring to ensure optimal functionality, consistent connectivity to the protocol, and reliable data access for all nodes.

- **quit**

When a validator decides to voluntarily exit from the active phase, it must continue making attestations and proposals as it did while active, except by exiting the queue (similar to the validation queue). The time taken for the exit phase depends on the number of previous validators in the queue.

- **wait**

Once the waiting period is over, the validator transitions to an exited state and no longer participates in the Ethereum chain. After a delay of a few days, the validator's assets can be successfully withdrawn from the network.

- **Validator rewards**

Rewards are distributed to Ethereum validators for participating in proposing and validating new blocks, primarily to ensure the continued operation of the Ethereum blockchain following its inherent framework rules. Validators receive rewards based on how well they maintain the network, and the precise mechanism for calculating rewards involves a complex set of formulas and variables. The main factors involved in determining rewards are the total amount of ETH staked, the proportion of the validator's stake to the total stake, and the validator's overall network performance. Validators with higher stakes receive a significantly higher share of rewards.

6. Governance structure of ESN Protocol

ESN Protocol ’ s autonomous model and governance structure are key to the sustainable development of its platform. This model ensures that all participants, whether ordinary users or large investors, have a role in the project decision-making process. The following is a detailed introduction to the governance structure of ESN Protocol :

6. 1 Decentralized governance

Participatory decision-making: ESN Protocol adopts a decentralized governance model that allows community members to participate in key decisions. This model is designed to promote a fair and transparent decision-making process, ensuring that the development of the platform is in the interest of the entire community.

Token Holder Power: In ESN Protocol , governance power is directly related to token holdings. Token holders can propose proposals, vote and have an opinion on the future direction of the platform.

6.2 _ Proposal and voting system

Proposal mechanism: Any token holder can propose rules changes, parameter adjustments, or new features.

Voting weight: Voting weight is usually proportional to the number of tokens held by an individual, encouraging users to actively participate in community governance.

Voting process: Proposals are decided through community voting. The results of the vote determine whether the proposal is accepted and implemented.

6. 3 Collaboration between communities and developers

Open Dialogue: ESN Protocol encourages open dialogue and collaboration between community members and development teams. Through forums, chat groups, and regular meetings, community members can exchange ideas and suggestions directly with the team.

Feedback and iteration: The development team adjusts and optimizes platform functions based on community feedback and voting results.

6. 4 Transparency and Accountability

Operational transparency: All governance decisions and voting results are open and transparent, and community members can view and audit them at any time.

Responsibility system: ESN Protocol has established a clear responsibility system to ensure that the development team and governance members are responsible for their decisions.

6.5 _ Long-term sustainability and adaptability

Adapt to market changes: ESN Protocol ’ s governance structure design helps to quickly adapt to market changes and technological advancements.

Continuous development: Through effective community-driven governance, ESN Protocol can continue to develop and improve to meet the ever-changing needs of users.

7. Conclusion and disclaimer

This document aims to provide a detailed explanation of the technical aspects of ESN Protocol to promote technical communication and understanding. When reading and using this document, please note the following:

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