

StakeStar Staking Pool Proposal

Status: Final

Last update: 2022/08/18

Short link: <https://bit.ly/3dKUjFI>

Slide deck: <https://bit.ly/3ci1kgK>

Background

A joint team of established blockchain validators and developers is proposing to develop the most user-friendly, intuitive and reliable Ethereum 2.0 staking pool using the SSV Network. We are big believers in the SSV community's vision to pioneer reliable and diverse ETH 2.0 staking. We hope to use our team's extensive experience building reliable and secure solutions to benefit the SSV project and the entire Ethereum community as a result.

About the team

The project team is lead by 3 professional and experienced validator entities:

- Spectrum Staking (<https://spectrumstaking.net>)
- Stardust Staking (<https://starduststaking.com>)
- Infinite Lux (<https://lux8.net/>)

All validators were participating in SSV Testnet V1 as Verified Operators with excellent performance.

The validator team has a very strong DevOps mindset and experience running mission-critical infrastructure. This includes the history of running validators across numerous chains like NEAR, Solana, Oasis, Polkadot, Mina, Cosmos ecosystem and others with high availability and performance.

To assist with the development of the Staking Pool the team has contracted OneStar company - a team of professional developers which has an extensive expertise in building smart contracts, backend, UI and infrastructure components. The OneStar team has deep knowledge of Ethereum financial smart contracts and tokenomics development. The team has been recently involved in full-stack development of Orion.Money (<https://orion.money>) project and was responsible for both Ethereum and Terra side smart contracts/UI and infrastructure.

Proposal

Disclaimer: Due to Ethereum 2.0 and SSV network both being actively developed technologies some proposed solutions and approaches could be changed at a later stage during MVP and pilot phases.

NOTE: Product name is TBD.

We are proposing to build an Ethereum 2.0 staking pool which will be reliant on the SSV network. The SSV network provides an extra level of security and reliability for Ethereum 2.0 validators, therefore we strongly believe that such a pool will provide a competitive advantage to the stakers over the existing solutions.

However, alongside well-known advantages, the SSV network introduces extra steps to the staking process. A user is required to purchase SSV tokens, register their validator with the SSV network and select a set of operators, including locking some SSV tokens as deposit. Our goal is to simplify the process of ETH staking as much as possible, hiding aforementioned complexities behind the scenes.

Major user features

- Stake pooling. Allow users to enter Ethereum 2.0 staking having as little as 0.1 eth.
The main value proposition of any staking pool on the Ethereum 2.0 network is the ability for the users to participate in staking without having 32 ETH. Ethereum 2.0 requires any user who wants to create a validator to lock at least 32 ETH. This is a prohibitive requirement for most potential stakers due to high initial investment. We aim to develop a solution which will allow users to enter staking with as little as 0.1 eth.
- Frictionless staking. No need to obtain SSV tokens for operator commission.
SSV network operators will likely set a non-zero commission for providing their services. In addition to that, SSV will charge a network fee. This commission has to be locked in SSV tokens at the time of validator registration with the SSV network. This extra step could create confusion for a user unfamiliar with the SSV network. Our goal is to simplify this process by ensuring that SSV tokens purchase and distribution are done without involving the user in this process.
- Minimum usage of the derivative assets.
We strongly believe that all the staking rewards should be paid in pure ETH.

To overcome this limitation most of the existing solutions issue their own derivative asset to reflect the amount of ETH staked and earned by the user. This idea has both pros and cons. Providing derivative tokens allows users to redeem their underlying asset through the liquidity pools. In a lot of instances derivative tokens could be used as collateral which gives even more flexibility to the user. However, this also means that liquidity pools have to be carefully maintained to support 1:1 peg. As we recently saw, even such market-leaders as Lido could experience de-peg events, when stETH is traded at a 10% discount to the underlying asset.

Taking into account that the SSV network launch will happen after the Merge event, we aim to avoid usage of derivative assets. We will likely issue receipt tokens, however, we are not expecting issuance of the rewards tokens or supporting liquidity pools for receipt

tokens.

- Trustless solution. No access to the smart contract responsible for the fees distribution

- Instant rewards accumulation (phase 2).

Stake pooling assumes an idle period between the point in time when the user stakes his/her ETH and the moment when a new validator is created after the accumulation of 32 ETH. We aim to maintain a dedicated ETH pool which will be used to compensate users for the lost rewards in between such events. This feature should increase solution attractiveness to the users who might not otherwise stake ETH due to uncertainty of when a new validator will be created.

(The same pool will be used to allow users exiting staking without needing to dismantle a validator. Please refer to the next list item)

- Exiting staking without validator dismantling (phase 2).

As mentioned before Ethereum 2.0 requires at least 32 ETH for the validator to be active. That in turn means that if a staker decides to exit a staking pool, one of the validators has to be scheduled for liquidation. We aim to maintain a dedicated ETH pool which will be used to mitigate such cases. Instead of liquidating validator the user's stake will be returned from such a pool*.

** The pool is not intended to support unlimited withdrawals. The main aim is to provide flexibility for small stakers as well as to mitigate temporary disbalance between stake/unstake requests.*

Operators

The above mentioned features are mainly directed towards attracting stakers. At the same time we believe that in order for the pool to be successful it is necessary to attract node operators as well. We are planning to implement a mechanism which will allow any interested party to become one of the node operators for a newly created validator. This mechanism will allow not only Group members but other infrastructure providers to benefit from the proposed solution. Initially participants will be added to an allowlist based on the past performance, at the later stage a formal due diligence process with precise requirements will be implemented.

Fees

The Pool will charge a portion of the ETH rewards in fees for pool usage.

Fees will be directed to

- operation and maintenance of the infrastructure supporting the pool. The Pool will be self-sustained and independent of any operator ownership.
- establishing an emergency reserve.

Project Plan

Milestone 1: Low-Level technical designs / UI mock-ups [2-3 weeks starting on 22.08.2022].

As a part of the proposal, we present a [high-level design](#) of the staking pool. In order to proceed with the implementation of the solution, the low-level design (LLD) should be developed first. The LLD is a refined version of high-level designs and describes every module of the intended solution in detail. The LLD is later used by developers as a reference during the implementation phase. Alongside LLD as a part of Milestone 1, we aim to produce UI/UX mock-ups showing the intended user flow.

Milestone 2: MVP implementation [8 weeks]

The second milestone is the most labor-intensive and will include the actual solution implementation based on the LLD and UI/UX mock-ups created during Milestone 1. Milestone 2 will be deemed completed after a dApp is deployed to the SSV testnet. This includes solidity smart contracts, backend infrastructure and UI/UX.

Milestone 3: Testing on testnet [3weeks]

After dApp is deployed to SSV testnet, we aim to conduct extensive testing before starting smart contracts audit. Preliminary testing will be done by the team. However, potentially the dApp will be made accessible for 3rd parties to provide independent feedback.

Milestone 4: Audit [2 weeks]

Smart contracts audit and possible fixes.

Milestone 5: Launch [3 weeks]

Landing page, documentation, Staking pool deployment to the mainnet.

Milestone 6: Enable withdrawals.

Partial deposit withdrawal mechanics. This is a must-have feature, which will be implemented before hand and enabled after withdrawal will be enabled on Eth 2.0.

Milestone 7*: Invite 3rd party operators.

Allow-list expansion for other operators. Automated operator ranking. Validator re-balancing between operators.

* - Milestone 7 will not be covered by the grant funding, however the design will contain provisions for this feature and we aim to deliver this feature after the pool pilot stage.

Funding requirements

According to [the grant program](#), seven grants up to \$100,000 were dedicated to development of staking pool projects. We would like to apply for one of the mentioned grants and kindly request

the full amount of \$100,000, split 50/50 in SSV/USDC. While this amount constitutes significant support in developing the described solution, we have estimated that total development, audit and marketing costs will likely be higher. Nevertheless, we are happy to proceed with the development of the staking pool by investing our own time and resources.

\$70,000 to \$75,000 of the requested amount will be spent for development and marketing, and the rest \$25,000 to \$30,000 will be spent to pay audit firm(s) expenses.

We would like to request payment to be done in five installments:

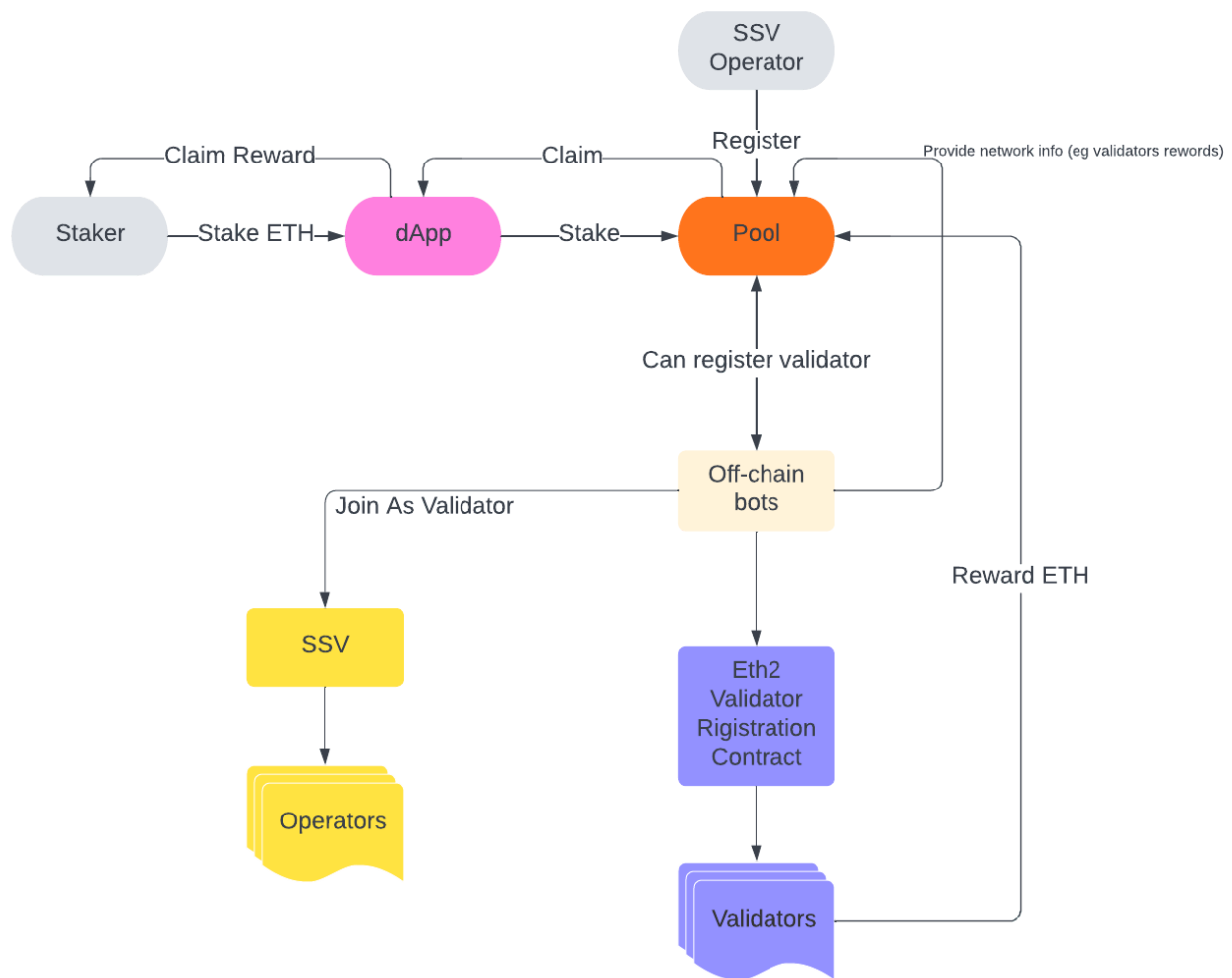
- \$10,000 to be paid upfront;
- \$30,000 after Milestone 1 (LLD design and UX/UI mockup) is completed and before Milestone 2 (MVP implementation) is started;
- \$30,000 after Milestone 2 (MVP implementation, including testnet deployment) is completed and before Milestone 3 (Testing) is started;
- \$15,000 after Milestone 3 (Testing) is completed and before Milestone 4 (Audit) is started;
- \$15,000 after Milestone 5 is accomplished. This includes completing the Audit, fixing issues if any and deployment of the solution to the mainnet.

NOTE: The team aims to use its own 32ETH to bootstrap the initial validator and start filling the buffer pool.

Technical details

Staking Pool Components

Below we present a high-level design of the Staking Pool and provide a short description of the main components: Pool and Off-chain sub-system.



The Pool

The core component is the Pool. Pool is the set of EVM smart-contracts developed in Solidity. Pool will be responsible for collecting staked Eth, maintaining staker's balances (including calculation and distribution of the rewards), registration and de-registration of new validators as well as registration and de-registration of operators.

Off-chain infrastructure

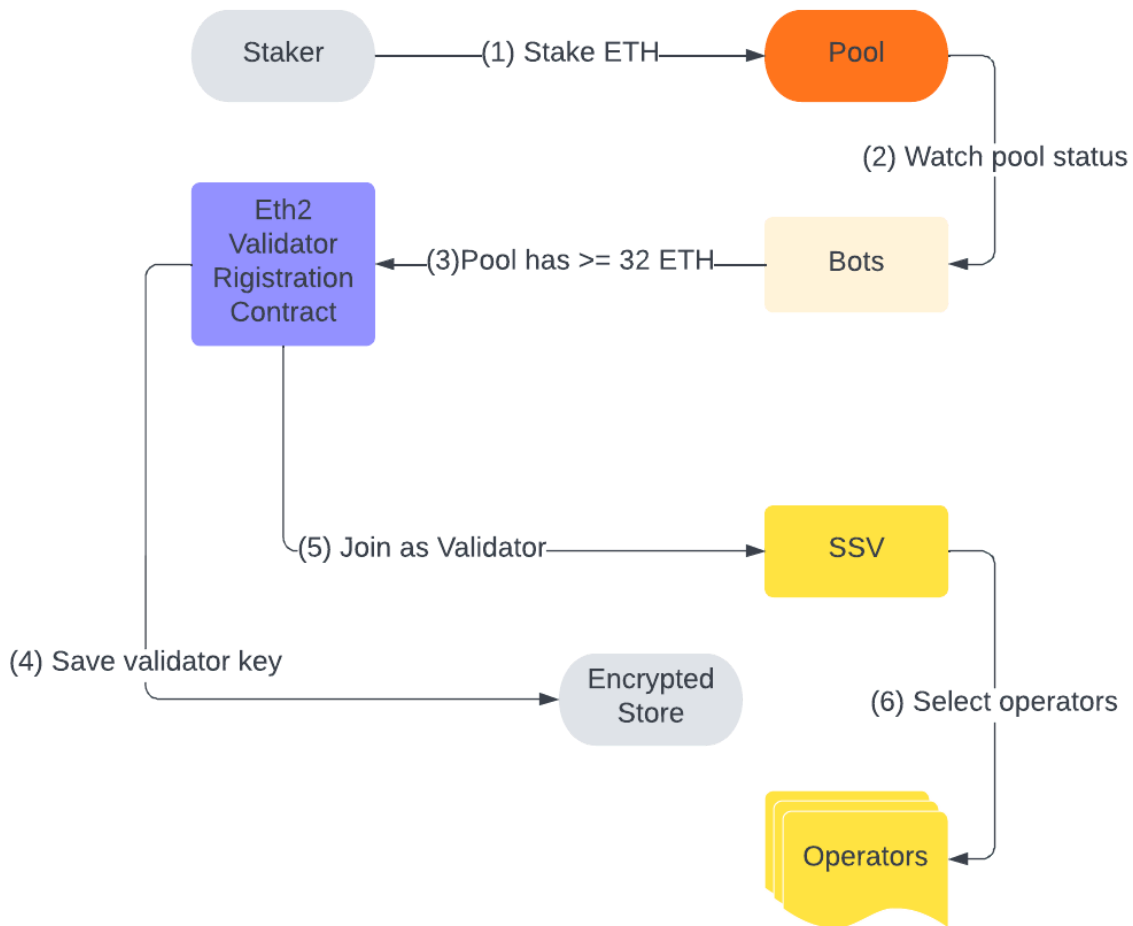
Off-chain infrastructure will be used to mitigate communication between the SSV network and Ethereum. This includes such activities as observing Pool smart-contracts balances for the ability to register a new validator, validator registration with SSV, managing SSV asset balances intended for operator rewards and so on.

As mentioned above, our goal is to streamline the user staking pool experience as much as possible. Therefore, we aim to manage SSV token purchases in the background, so that users don't need to be involved in this process. The exact flow of how this will happen will be designed at a later stage. As for now we anticipate that part of the validator's ETH rewards will be put aside as a staking pool commission. This commission will be later directed towards periodic SSV tokens purchase.

It is worth noting that our aim is to build a trustless solution. For this purpose we will be using [ETH1_ADDRESS_WITHDRAWAL_PREFIX](#) withdrawal prefix along with the address of the smart contract responsible for the rewards and balances maintenance. In this case, even if signing keys of the validator are compromised, the ETH balance could be only withdrawn to a specific smart contract.

Staking flow

1. Staker stakes ETH to the Pool and receives a pool token (**spETH-ERC20**).
2. Watchers (off-chain infrastructure) monitor pool state.
3. If the pool has ≥ 32 ETH initiates the procedure of validator registration.
4. Store validator private key to the encrypted store.
5. Join as SSV Validator.
6. Select 4 SSV Operators. Four node operators will be selected from allowlist based on their past-performance and SSV network commission. The allowlist will be initially compiled based on the node operators testnet performance. At the later stage a transparent mechanism will be introduced in order to include well-performing or exclude poorly-performing node operators.



Operators

It is planned to add 4 operators to the initial allowlist of the contract for the pilot phase after the pool launch on ETH Mainnet. This will include Spectrum, Stardust, Lux8 and OneStar operators.

Phase 6 of the project aims to add support for other operators to take part in the pool's delegation strategy. Operators will be allowed to apply to join the delegation pool and participate in an automated performance and availability ranking system.

Delegation system will automatically assign validators to high performance operators. Details on this are TBD.

Product support and ownership

All smart contract and off-chain bot code will be open-sourced.

Infrastructure and pool operations will be owned by the OneStar team and a portion of pool fees will be directed for maintaining the infrastructure. Off-chain bots and UI will be run on multi-cloud infrastructure to achieve highest availability and reliability.

OneStar will create necessary support documentation and provisions to allow pool and infrastructure ownership to be transitioned to a different entity if such a situation and need arises.