

Validators DAO

White Paper

Project & Ecosystem Overview

Version 2.0.0

June 2026

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1. Executive Summary

Validators DAO is a project that aims to support the decentralization and efficiency of the Solana network in practical terms, through software. Its mission is to lower the learning, time, and cost burdens of running a validator, to put to good use the network bandwidth that has so far been underutilized, and thereby to contribute to Solana's sustainability.

Solana is fast, decentralized, and fair, yet it also faces structural challenges. The burden of running a validator is heavy, and small and mid-sized validators that struggle to cover their costs continually give up operating. As a result, stake concentrates among a small number of large operators, and the network's decentralization declines. In addition, SWQoS (Stake-weighted Quality of Service), the mechanism that determines transaction priority, is not fully utilized because it is difficult to configure and verify — producing an inefficiency in which bandwidth goes unused even though it is available (sources in Chapter 10).

These are not separate problems; they arise from the same structural causes — technical difficulty, demands on time, and economic constraints. Validators DAO aims to fill this gap with software and, by lowering the burden and cost of operation, to restore Solana's decentralization and efficiency in practical terms.

Its approach consists of three pillars. First, “SLV,” a suite of open-source tools that support the operation of validators and RPC nodes, together with its AI assistance, “SLV AI.” These greatly lower the learning cost and time burden of operation and help create an environment in which validators can keep running. Second, the “decentralized SWQoS market,” a mechanism (as a concept and a goal) for putting surplus SWQoS bandwidth to fair and transparent use. Third, “elSOL,” a mechanism that puts staked SOL to work as SWQoS bandwidth and so contributes to Solana's bandwidth efficiency. These function independently while complementing one another.

The concept of Validators DAO emerged during the development of Epics DAO, our open-source development support project. Facing the difficulty of securing a stable, high-speed development environment on Solana, we built ERPC and SLV to solve it, and that work has become the foundation of today's Validators DAO. What we consistently aim for is a sustainable ecosystem in which developers, validators, and stakers can take part without undue burden, and in which the accumulation of their participation leads to the healthy decentralization and efficiency of the Solana network.

2. Structural Challenges Facing the Solana Network

2.1 The Decline and Concentration of Validators

Running a Solana validator carries heavy technical, time, and economic burdens. The work required day to day — node updates, troubleshooting, performance optimization, continuous monitoring, and more — is advanced and demands considerable time and knowledge.

This difficulty and burden of operation deter small and mid-sized validators from entering and continuing. Teams that cannot secure sufficient capital or stake cannot stay financially viable and are forced to withdraw. The Solana Foundation runs a stake-support program to assist small and mid-sized validators, but in many cases operators still do not reach the financial sustainability

needed to continue once the support period ends, and they shut down their operations (sources in Chapter 10).

As a result, stake concentrates among a small number of large operators, and the network's decentralization is eroded. The decline of validators and the concentration of stake are structural challenges that shake Solana's founding principles of speed, decentralization, and fairness. Because continuous operation is difficult, operators drop out, and the number of active validators has trended downward over the long term. Since the number of active validators varies from time to time, specific figures need to be checked on an ongoing basis against public data.

2.2 The Inefficiency of Priority Bandwidth (SWQoS) and Unused Bandwidth

On Solana, the SWQoS (Stake-weighted Quality of Service) mechanism determines transaction priority according to the amount of stake. It was introduced to maintain network quality by preventing a rise in spam and disorderly transactions and by prioritizing reliable nodes. In a decentralized network with no central gatekeeper, this mechanism of prioritizing trustworthy transactions can be seen as a foundational concept for keeping the network healthy over the long term.

In practice, however, this mechanism does not work well enough. SWQoS configuration is complex, and the means to verify whether it is applied correctly are limited. When a validator and an RPC node are operated by different parties, the two must coordinate their configuration, which adds a heavy technical and time burden.

Moreover, changing SWQoS settings often requires restarting the validator, and a restart carries the risk of lowering its score or performance. There is a no-downtime migration technique that avoids restarts, but it requires running multiple nodes simultaneously, so the time, monetary, and operational costs remain stubbornly high. As a result, it tends to be carried out only when a substantial amount of stake is involved, and applying it to small stakes or in a distributed way is, in practice, difficult.

Consequently, the nodes that can configure SWQoS properly are limited, and while bandwidth is in surplus, many projects that need it cannot make sufficient use of it. Solana has fallen into an inefficient structure in which bandwidth goes unused even though it is available, and this in turn becomes a factor that further concentrates activity onto a limited set of nodes.

2.3 The Two Challenges Arise from the Same Structure

The decline and concentration of validators and the non-use of bandwidth appear at first to be separate problems, but they arise from the same structural causes: technical difficulty, demands on time, and economic constraints. Because operation is complex and burdensome, operators drop out, and that same burden prevents bandwidth from being put to good use — a vicious cycle that simultaneously pushes down Solana's decentralization and efficiency.

Validators DAO aims to fill this gap with software and, by removing the barriers of learning cost, operating cost, and economics, to restore the decentralization and efficiency of the Solana network in practical terms.

3. The Validators DAO Approach

3.1 Three Pillars

Validators DAO is intended to solve, through software, the structural challenges Solana faces — the decline and concentration of validators, the inefficiency of SWQoS, and the stagnation of bandwidth use. Its design consists of the following three pillars.

SLV / SLV AI: open-source tools that support the launch, operation, and maintenance of validators and RPC nodes and lower the technical burden and operating cost, together with their AI assistance.

Decentralized SWQoS market: a mechanism for putting surplus SWQoS bandwidth to good use, fairly and transparently, for those who need it (described in this document at the level of concept and purpose).

elSOL: a mechanism that puts staked SOL to work as SWQoS bandwidth and contributes to Solana's bandwidth efficiency.

Though independent mechanisms, they act complementarily. When these components function together, they form a foundation that supports Solana's decentralization and efficiency over the long term.

3.2 SLV — Lowering the Burden and Cost of Operation

SLV is an open-source tool for simplifying the launch, operation, and maintenance of validators and RPC nodes. Operating on Solana requires advanced knowledge, and a great deal of time goes into daily maintenance, updates, and troubleshooting. This has been a major barrier to entry and continuation for small and mid-sized validators.

SLV resolves this challenge. By automating node setup, monitoring, updates, and failure recovery, and by standardizing the tasks operation requires, it greatly reduces the learning cost and time burden. It also supports advanced operations such as no-downtime migration that avoids restarts. As a result, operators are no longer driven by daily chores and can focus on improving the network and developing products. Lowering operating cost and burden makes it easier for validators struggling to cover their costs to keep running.

SLV is released as open source, so anyone can use, verify, and improve it. By sharing operational know-how and closing the technical gap, it becomes a foundation that supports the technical decentralization of the Solana network.

3.3 SLV AI — AI-Assisted Operation and Development

SLV AI combines SLV with AI assistance to further support validator operation and Solana application development. By having AI assist with some of the decisions and tasks in operation and development, it aims to make it possible to build a high-quality Solana development and operating environment in less time.

This creates breathing room for both operators and developers. Time once consumed by operation can be redirected to improving products and contributing to the network, helping to lower the cost and burden of validator operation still further.

3.4 The Decentralized SWQoS Market — A Mechanism for Fair, Effective Use of Bandwidth

Until now, SWQoS bandwidth has often been handled as private, one-off contracts between validators and RPC operators, lacking standards and transparency. The decentralized SWQoS market is an idea that aims to replace this closed structure with an open, fair, and transparent coordination mechanism. Here, “market” does not mean a trading venue for crypto-assets, tokens, or financial instruments; it refers to a design concept for coordinating, making visible, and allocating the use of SWQoS bandwidth in a fair and transparent way.

The aim is to let surplus SWQoS bandwidth be put to good use, fairly and transparently, by those who need it. By enabling demand-side RPC operators and developers to use just as much bandwidth as they need without entering complex direct contracts individually, it raises the utilization efficiency of the network's communication resources. Bandwidth, a surplus resource, is put to work for the whole network rather than skewed toward particular parties — that is the purpose of this mechanism.

Note that this document describes the decentralized SWQoS market solely as a concept, a purpose, and a design direction. It does not announce, describe, or promise economic terms such as the issuance, distribution, or sale of any particular token, price design, allocation, or the distribution of rewards.

3.5 elSOL — A Mechanism Serving Solana's Bandwidth Efficiency

elSOL is a liquid staking token (LST) based on the Stake Pool Program of the SPL (Solana Program Library). In general, staked SOL is not necessarily put to use as SWQoS bandwidth; elSOL is designed with the intent of connecting stake to the use of SWQoS bandwidth. In this way, it aims to let staked assets be put to work as network bandwidth and to contribute to improving Solana's bandwidth efficiency.

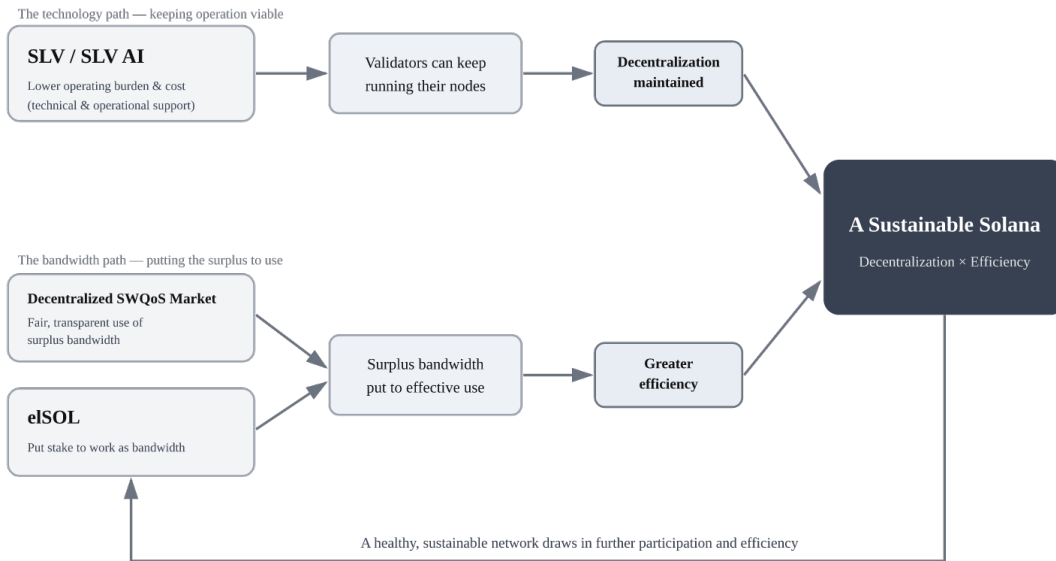
Operational facts about elSOL — its mechanism, risks, fees, and so on — are described in a separate elSOL White Paper. This document does not deal with the acquisition, purchase or sale, trading terms, price design, yield, or revenue sharing of elSOL; it confines itself to indicating elSOL's position as a mechanism that serves to improve Solana's link performance and efficiency. This document does not suggest or promise any yield, APY, revenue sharing, or other economic return in respect of elSOL. Furthermore, elSOL does not guarantee value identical to SOL, nor does it guarantee constant liquidity, redeemability, price, yield, or eligibility to use SWQoS.

3.6 Two Paths — Balancing Decentralization and Efficiency

These three pillars lead to Solana's sustainability through two paths. One is the “technology path.” As SLV / SLV AI lower the burden and cost of operation, validators find it easier to keep running, the excessive concentration of stake eases, and the network's decentralization is preserved. The other is the “bandwidth path.” As the decentralized SWQoS market and elSOL put previously surplus bandwidth to good use, the efficiency of the whole network rises.

Though separate efforts, the two head toward the same goal of Solana's sustainability. When decentralization and efficiency are preserved together, Solana moves closer to a healthier and more sustainable network, and that health draws in further participation and efficiency.

How Validators DAO Works — Decentralization and Efficiency for a Sustainable Solana



How Validators DAO works — the “technology path” supports decentralization and the “bandwidth path” supports efficiency; balancing the two leads to a sustainable Solana.

4. Contributing to Solana's Sustainability

What Validators DAO consistently aims for is to contribute to the sustainability of the Solana network. We seek to achieve this from two angles.

One is lowering the burden and cost of operation. If SLV / SLV AI lower the learning cost and time burden of operation, small and mid-sized validators that previously ran into the wall of cost can keep running more easily. As more validators are able to continue, the excessive concentration of stake eases and the network's decentralization is preserved. Decentralization is the foundation that lets Solana remain fast, decentralized, and fair.

The other is putting surplus bandwidth to good use. If SWQoS bandwidth that has lain dormant and unused reaches the participants who need it, fairly and transparently, the resource-utilization efficiency of the network as a whole rises. Greater efficiency means the network can create more value with limited resources.

When continuity of operation and effective use of bandwidth mesh together, Solana moves closer to a healthier, more sustainable network that balances decentralization and efficiency. This is not for the benefit of any particular party, but an effort that serves the health of Solana itself as a public network. Validators DAO seeks to be an implementation that underpins this public good from the standpoint of technology, operation, and mechanism design.

5. Operational Transparency and Reliability

To make the effective use of bandwidth something that can be entrusted with confidence, operational transparency and reliability are essential. Validators DAO places importance on mechanisms for monitoring, automation, and auditing that ensure operational reliability.

On monitoring, we envision mechanisms that continuously check matters such as how bandwidth is being applied, the consistency of configuration, and network stability, and that — when an anomaly is detected — notify the relevant parties and prompt reconfiguration or verification as needed. By catching configuration inconsistencies and unstable connections early, operational problems are prevented before they arise.

On automation, we aim for stable, reproducible operation by automating operational workflows in software as far as possible and reducing manual intervention. This further lowers the burden on operators while curbing the risk of human error.

In addition, to strengthen the safety and transparency of the mechanism, we plan a third-party software audit. By verifying the safety of operation-related processing from an external perspective, we aim to realize a reliable mechanism that participants can use with confidence.

6. Current Policies

This chapter sets out the current policies of Validators DAO. These efforts are not investment products; their purpose is to support network operation, improve efficiency, and maintain decentralization.

SLV / SLV AI

SLV is released as open source, so anyone can use, verify, and improve it. SLV / SLV AI are tools whose purpose is to support the operation of validators and RPC nodes and to support development; they do not provide or promise yield, APY, revenue sharing, or any other economic return.

Self-Custody and Solana-Native Staking

Where the Validators DAO ecosystem provides tools related to staking, this is limited to self-custody (self-managed) support that lets users themselves use Solana's native staking features (creating a stake account, delegating to a validator, deactivating, withdrawing, and so on). Users retain their own wallet, stake authority, and withdraw authority. Validators DAO does not take custody of users' SOL, and provides none of the following: managed staking, guaranteed yield, APY, or investment advice.

Decentralized SWQoS Market

The decentralized SWQoS market is currently at the stage of research, development, and study. This document states only its concept, purpose, and design direction. It does not deal with economic terms such as the issuance, distribution, or sale of any particular token, price design, allocation, or the distribution of rewards, and it does not announce, solicit, or promise them.

What We Do Not Provide

Validators DAO does not provide programs that promote economic returns — such as yield, APY, revenue sharing, fee sharing, or buy-backs. Nor does it provide trading pathways such as an official DEX, swap, marketplace, or order routing.

7. Future Direction

Validators DAO will advance, step by step, the expansion of operational and development support through SLV / SLV AI, the research and development of the decentralized SWQoS market, and its contribution to Solana's sustainability. The policy is to take these on in turn, after passing through the appropriate stages.

Specific timing and ordering will be decided carefully in light of the state of development, the community, and the regulatory environment. What Validators DAO consistently aims for is to keep supporting a sustainable network that balances Solana's decentralization and efficiency, by lowering the burden and cost of operation and putting bandwidth to good use. This purpose and goal will not change.

8. Core Team

We originally founded a software development company in Japan in 2012, developing and operating cloud applications for clients that included government-affiliated institutions in Japan. At a development retreat in California in the spring of 2020, we were struck by Solana's speed and immediately began research and development. In the autumn of 2020, we established the blockchain technology research institute ELSOUL LABO B.V. in Amsterdam, the Netherlands. Today we conduct research and development in blockchain technology centered on Solana, operate a node as a validator on the Solana chain, and contribute to the Solana Labs GitHub repository as a contributor. Validators DAO is an effort born from this hands-on validator operation and development.



Fumitake Kawasaki

Co-founder

Software researcher. Strong across backend, cloud infrastructure, and smart-contract development, with a focus on making development highly efficient. "SOULs," a serverless framework he built to solve real problems in the field, has been certified by the Dutch government as an advanced research and development project (WBSO).



Shota Kishi

Co-founder

Software researcher. Strong in frontend development, building multi-platform apps with user-friendly UX through human-centered design. He also takes part in backend, cloud infrastructure, and smart-contract development, designing and building with overall balance in mind. A contributor to Solana Labs.



James Neve

Technical Advisor

AI researcher. Holds a PhD in machine learning and has published eight academic papers to date. With broad and deep knowledge spanning backend, frontend, and machine learning, he solves the team's toughest problems with a multifaceted approach.

9. Links

- Validators DAO official site: <https://dao.validators.solutions/>
- SLV (Solana validator / RPC tools): <https://slv.dev/>
- elSOL official site: <https://elsol.app/>

- ERPC (Solana Enhanced RPC): <https://erpc.global/>
- Validators DAO community Discord: <https://discord.gg/C7ZQSrCkYR>

10. References and Sources

The descriptions of the Solana network in this document are based on the following publicly available sources.

- Solana Foundation, Validator Health Report: March 2023 — solana.com
- Solana Foundation, Validator Health Report: October 2023 — solana.com
- Solana, A Guide to Stake-weighted Quality of Service (SWQoS) on Solana — solana.com/developers
- Solana, Stake Pool Program (SPL) — spl.solana.com/stake-pool

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This document is a project and ecosystem overview provided for informational purposes; it is not a MiCA crypto-asset white paper, a securities prospectus, an offering document, or a solicitation to buy, sell, or trade any crypto-asset, token, NFT, or financial instrument. Nothing in this document promises profit, revenue sharing, fee sharing, yield, staking rewards, buy-backs, liquidity, listing, token distributions, or future value, and nothing should be relied upon as the basis for any investment decision. This document does not announce or solicit the issuance, distribution, or sale of any new token. This document supersedes all prior public and non-public versions.

Thank you for reading to the end. If you are interested in our work, we warmly invite you to join the Validators DAO Discord community. We look forward to staying in touch.