

Sonic: Redefining the Future of DeFi Infrastructure

Content

1. Background and Motivation Behind the Sonic Upgrade	4
1.1 R&D Team and Leadership Transition	5
2. Sonic Achieves Four-digit TPS Performance	6
2.1 SonicVM: A Next-Generation Virtual Machine Architecture	8
2.2 SonicDB: An Efficient Storage Engine	9
2.3 Sonic Gateway: Ethereum Crosschain Bridge	10
3. Tokenomics and Incentive Mechanism Design	12
4. Stablecoin Ecosystem and Nested Yield Strategies	16
4.1 Growth Performance	16
4.2 Strategy 1: Silo v2 Loop Lending for High-Leverage Rewards	17
4.3 Strategy 2: Euler + Rings Protocol Combo for Multi-platform Rewards	19
4.4 Strategy 3: Shadow DEX Liquidity Provision for Fees and Reward Points	20
4.5 Risk Hedging: Protecting Gains from Market Volatility	20
4.6 Ecosystem Outlook	21
5. Sonic's Innovations in DeFi Infrastructure	22
5.1 Core Mechanism: Adaptive AMM Curve	22
5.1.1 Brief Review of Curve V2	22
5.1.2 Flying Tulip's Optimization and Upgrades	27
5.2 Comparison with Curve V2	28
5.3 AMM-Based Dynamic LTV Lending Model	29
5.3.1 Overview of Curve's LLAMMA Model	29
5.3.2 Flying Tulip's Dynamic LTV Model	33
5.4 Competitive Advantages and Risks	34
6. Summary and Outlook	35
About HTX Research	36
References List	37
Disclaimer	38

1. Background and Motivation Behind the Sonic Upgrade

Singapore, April 10, 2025 - Fantom Opera is a high-performance layer-1 blockchain built upon an asynchronous Directed Acyclic Graph (aDAG) consensus mechanism, which employs a Byzantine Fault Tolerance consensus protocol, Lachesis, and is compatible with the Ethereum Virtual Machine (EVM).

While Opera demonstrated high theoretical throughput and rapid transaction confirmation times early on, limitations emerged as application scale and onchain state data grew. Specifically, Opera's reliance on Ethereum's traditional account-storage model and Merkle Patricia Trie led to bloated state storage, slow node synchronization, and performance bottlenecks in EVM execution. These factors severely restricted Opera's practical transaction throughput and scalability, necessitating architectural innovation.

"Sonic" represents Fantom's next-generation technology stack upgrade, meticulously designed to address these challenges. The team's objective is to achieve a significant leap in performance and efficiency directly from the underlying infrastructure without resorting to sharding or layer-2 solutions.

After thorough research, the Fantom development team determined that realizing orders-of-magnitude improvements required comprehensive optimization of the virtual machine execution engine, state storage mechanism, and consensus protocol. However, these critical improvements could not simply be integrated into the existing Opera chain via soft forks ([Andre Cronje's Sonic Labs Announces L1 Launch, Incentivizing Users With Token Airdrop](#)).

Consequently, the team launched an entirely new network, Sonic, as an independent upgrade to Fantom, fully leveraging these innovations.

The rationale behind this upgrade is twofold: firstly, maintaining compatibility with the Ethereum ecosystem to safeguard existing investments, and secondly, overcoming the inherent limitations of the Opera architecture to achieve substantial advancements in key metrics such as transaction throughput, finality, and node resource consumption (Figure 1).

FIGURE 1: CROSS-CHAIN CAPITAL INFLOWS SUSTAIN SONIC'S TVL GROWTH AMID BROADER MARKET DOWNTREND



Source: [Defillama](#)

1.1 R&D Team and Leadership Transition

During the upgrade process, Fantom underwent a significant restructuring of its branding and organizational structure, establishing Sonic Labs, a dedicated entity focused on developing the new network.

Key members from the original Fantom Foundation continue to lead the new project, with Michael Kong serving as CEO and David Richardson as Executive Chairman. Notably, renowned DeFi architect Andre Cronje rejoined the project as chief technology officer at Sonic Labs, providing critical technical leadership for the upgrade. Cronje, who has famed for projects such as [Yearn.Finance](#), known for token economics innovations like the ve(3,3) model, significantly strengthens Fantom's technical direction.

Additionally, in 2022, Fantom brought on Professor Bernhard Scholz from the University of Sydney as chief research officer to spearhead the design of the new virtual machine and database. These leadership shifts demonstrate Fantom's strong commitment to technology-driven innovation: a top-tier R&D team has invested over two and a half years optimizing the Opera chain's execution stack and storage system, enabling nodes to operate more efficiently and at a reduced cost. The revamped leadership team and refreshed brand identity have infused new vitality into Fantom, laying a solid organizational foundation for the successful deployment of Sonic.

2. Sonic Achieves Four-digit TPS Performance

Compared to Fantom Opera, Sonic represents a comprehensive leap in performance, solidifying its status as a high-performance blockchain. In fully EVM-compatible mode, Sonic can handle transaction throughput exceeding 2,000 TPS. With aggressive optimization, peak throughput may reach 10,000 TPS, placing it among the few layer-1 blockchains achieving four-digit TPS.

Regarding transaction finality, Sonic leverages the upgraded SonicCS 2.0 consensus to reduce average block generation and confirmation times to approximately 0.7 seconds, significantly faster than Avalanche (1–2 seconds) and Ethereum's mainnet (several minutes), offering a near real-time user experience. Thanks to efficient consensus algorithms and architectural optimizations, Sonic's average transaction fees are as low as \$0.0001—far below most mainstream layer-1 chains—potentially facilitating use cases like micro-payments and high-frequency trading.

Additionally, SonicDB's new storage engine achieves approximately 90% storage savings, making node operations lighter and synchronization quicker, thereby enhancing the network's overall robustness (Figure 2).

In summary, Sonic leads comprehensively across throughput, latency, cost, and storage efficiency, providing robust support for more complex decentralized applications and extensive user interactions.

FIGURE 2: CORE INFRASTRUCTURE COMPONENTS OF SONIC



SonicVM

- Lightning-fast execution
- 100% EVM compatible: Code in Solidity and Vyper
- Increased security and reduced app crashes



SonicDB

- Low latency (fast transactions)
- Highly specialized (RPC, validator, and observer nodes)
- Low storage requirements
- Low cost maintenance



Sonic Gateway

- Native bridge
- Fastest and most secure way to bridge from Ethereum and beyond
- Audited by: OpenZeppelin, certora, Quantstamp

Source: [Sonic Labs](#)

2.1 SonicVM: A Next-Generation Virtual Machine Architecture

SonicVM, a newly developed virtual machine, was introduced as part of the Fantom Sonic upgrade. It replaces the traditional Ethereum Virtual Machine (EVM) to significantly enhance execution efficiency. SonicVM is fully compatible with the EVM, supporting existing smart contract languages like Solidity and Vyper. This ensures that contracts deployed on Opera can run seamlessly on the Sonic network without modifications.

While preserving compatibility, SonicVM introduces a series of fundamental optimizations: at runtime, it dynamically converts EVM bytecode into a more efficient internal representation for just-in-time execution and caches the converted results to eliminate redundant translations on subsequent calls.

Additionally, SonicVM optimizes computationally intensive operations to avoid repetitive calculations, such as caching SHA3 hashing computations. It also pre-analyzes and caches valid jump destinations within contract code, enabling faster execution and improving security by quickly verifying the legitimacy of jump instructions.

Collectively, these improvements significantly reduce the computational overhead associated with executing smart contracts, boosting throughput capacity while maintaining determinism and security. Official tests indicate that SonicVM's deployment dramatically improves transaction processing capability and reduces the average execution latency per transaction to milliseconds, laying a solid foundation for Sonic's higher TPS goals.

2.2 SonicDB: An Efficient Storage Engine

To address the issues of bloated onchain data storage and slow node synchronization experienced in the Opera era, Sonic introduces a novel state database engine known as SonicDB (internally codenamed “Carmen”).

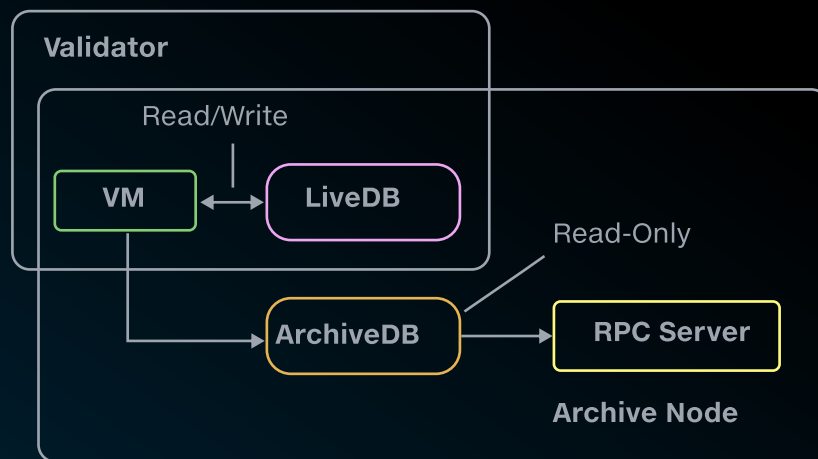
SonicDB redesigns the structure of blockchain state storage, achieving nearly 90% data compression through a layered storage strategy.

Specifically, SonicDB splits the blockchain state into two distinct databases: the LiveDB, which exclusively stores the current global state optimized for efficient state transitions and block execution, and the ArchiveDB, which archives historical blocks and states to support scenarios requiring complete historical data access.

This separation-of-duties architecture substantially reduces the amount of data validator nodes must process during consensus and block production. According to reports, integrating SonicDB reduces the synchronization time for new nodes to fully sync from the genesis block to under two days. This is a significant improvement over the Opera nodes, which required weeks to synchronize. SonicDB's innovation at the storage layer also dramatically decreases disk and memory requirements for running full nodes, enhancing read/write performance and state-query efficiency (Figure 3).

Consequently, hardware costs and operational complexity for running Sonic network nodes are significantly reduced, enabling broader participation in network maintenance, thus promoting decentralization and sustainability of the blockchain.

FIGURE 3: SONICDB VALIDATOR AND ARCHIVE NODE ARCHITECTURE



Source: [Sonic Labs docs](#)

2.3 Sonic Gateway: Ethereum Crosschain Bridge

To achieve interoperability with Fantom and other blockchains, Sonic introduced its native bridging module, [Sonic Gateway](#). This gateway provides a secure and efficient asset bridge between Sonic and the Ethereum mainnet, functioning similarly to an "L2-like" bridging solution.

Through Sonic Gateway, users can seamlessly transfer assets from Ethereum to Sonic and vice versa, thus leveraging the advantages of both blockchains.

The bridging process generally consists of three stages:

1. Deposit Confirmation: Users deposit assets into the Sonic Gateway smart contract on Ethereum. This step requires approximately 15 minutes for Ethereum finality.

2. Fast Verification on Sonic: The gateway quickly verifies the deposit on the Sonic network (confirmation takes approximately 1 second on Sonic) and marks the assets for bridging.

3. Batch Asset Transfer: At preset intervals (such as every 10 minutes), the gateway releases assets from Ethereum and mints or unlocks corresponding tokens on Sonic, completing the crosschain transfer. Similarly, assets returning from Sonic to Ethereum are processed in batches approximately every hour.

This batch-processing mechanism strikes a balance between security and efficiency. Regular batch transfers reduce costs, while users needing immediate bridging can opt for paid fast-track processing.

Through the integration of smart contracts, multisignature verification, and validator participation, Sonic Gateway ensures reliability and includes fault-tolerance mechanisms to handle exceptional circumstances. The gateway's design allows Sonic to seamlessly tap into Ethereum's vast user base and asset liquidity, simultaneously utilizing Sonic's high-performance and cost-efficient environment for running decentralized applications.

3. Tokenomics and Incentive Mechanism Design

Upon the launch of the Sonic mainnet, Fantom introduced a new native token, S. The value of S is initially pegged to the existing FTM token, enabling current FTM holders to exchange their FTM for S at a 1:1 ratio. Initially, this exchange is bidirectional, with a gradual transition to a one-way swap to encourage value migration toward S.

The S token performs multiple functions within the Sonic ecosystem, including payment of transaction fees, staking for validator participation, and governance voting. For the first six months post-launch, the S token supply remains non-inflationary (zero inflation), meaning the total supply does not increase.

Following this period, based on prior community consensus, the network will begin issuing new S tokens as part of planned inflation to support ecosystem incentives, including airdrops, growth funds, and validator staking rewards. By initially controlling the token supply, gradually introducing targeted inflation, and employing mechanisms such as token burning, Sonic balances token inflation against incentives.

Sonic also introduces an innovative Gas Fee Monetization (FeeM) mechanism (Figure4). Under this model:

- If a user transacts on an application participating in FeeM, up to 90% of the transaction fees are directly distributed to developers, with the remainder allocated as tips to validators.
- Conversely, for transactions on non-FeeM applications, 50% of transaction fees are directly burned, and the remaining fees are allocated as tips to both the ecosystem treasury and validators.

FIGURE 4: COMPARISON OF TRANSACTION FEE DISTRIBUTION WITH AND WITHOUT FEEM PARTICIPATION

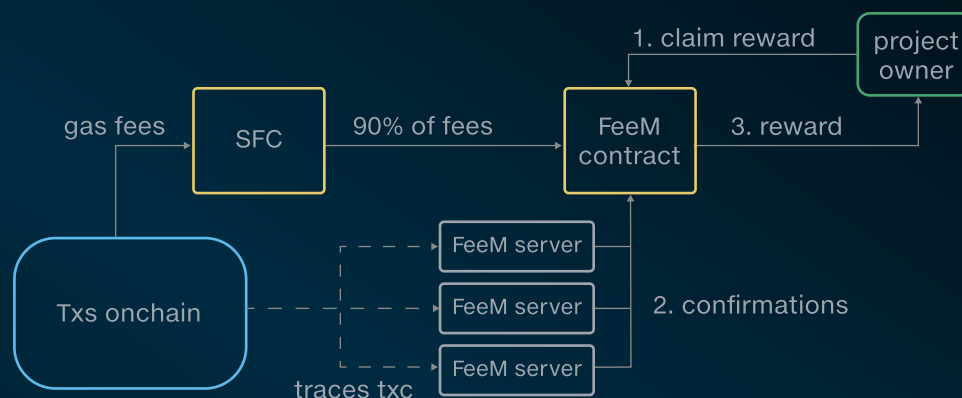
Type	Sonic (Non-FeeM TX)	Sonic (FeeM TX)
Burn	50%	0%
Validator Reward	45%	10%
Ecosystem Vault	5%	0%
Fee Monetization	0%	90%

Source: [Sonic Labs docs](#)

This approach takes inspiration from Web2-style revenue-sharing models for content creators, providing continuous income streams for developers. It encourages the deployment of high-usage applications on Sonic without developers needing to build separate application-specific chains to capture value.

Ultimately, the FeeM model rebalances economic interests between infrastructure providers (validators) and developers, fostering sustained innovation and growth on the Sonic network (Figure 5).

FIGURE 5: GAS FEE ALLOCATION AND FEEM-BASED REWARDS DISTRIBUTION WORKFLOW FOR PROJECT OWNERS



Source: [Sonic Labs Docs](#)

If the FeeM model represents Sonic's long-term commitment to developers, then its points-based reward mechanism reflects direct appreciation to users and the broader community. Sonic has designed a multi-layered [incentive system](#) consisting of Passive Points, Activity Points, and App Points (Gems), with approximately 200 million S tokens allocated for distribution via airdrops across multiple seasons.

Users holding whitelisted assets in wallets like Rabby or MetaMask automatically earn Passive Points without additional action; participating in liquidity provision or engaging actively in ecosystem applications grants Activity Points at double the passive rate. Additionally, applications within the Sonic ecosystem are awarded Gems based on metrics like transaction volume and user count, which they can subsequently distribute to active users. These Gems can ultimately be redeemed for S tokens.

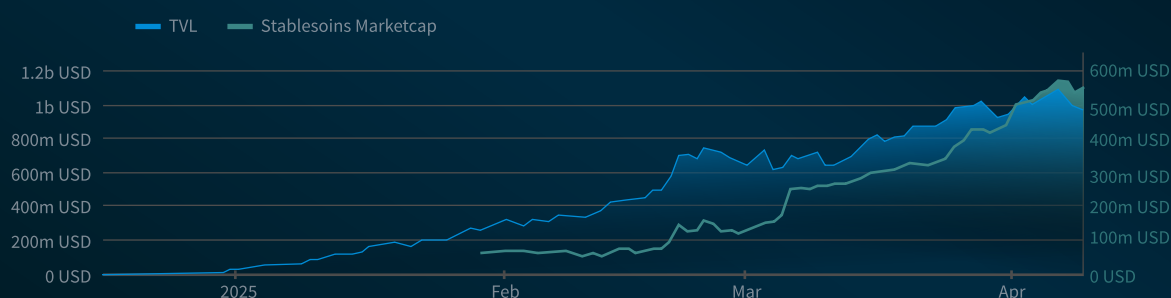
4. Stablecoin Ecosystem and Nested Yield Strategies

4.1 Growth Performance

In 2025, amid the volatile crypto market, the Sonic blockchain demonstrated remarkable counter-cyclical growth, driven primarily by rapid expansion in its decentralized finance (DeFi) ecosystem. Over recent months, Sonic's total value locked (TVL) surged dramatically, from approximately \$150 million to nearly \$1 billion, marking an increase of over 500% (Figure 6).

Particularly notable is the recent one-month inflow, during which TVL grew around 83%, surpassing \$850 million at the time of writing and placing Sonic 12th among all layer-1 blockchains. The core driver of this growth has been the stablecoin protocols on Sonic, with total stablecoin supply increasing from \$100 million in February 2025 to more than \$520 million by the end of April 2025 — an increase exceeding 420% (Figure 6). Concurrently, competing stablecoins such as DAI and FRAX lost around 22 percentage points in market share.

FIGURE 6: SONIC'S GROWTH OF TOTAL VALUE LOCKED DRIVEN BY INCREASING STABLECOIN INFLOWS IN 2025



Source: [Defillama](#)

Significant whale activity and asset accumulation within Sonic's stablecoin ecosystem highlight strong investor confidence in its infrastructure upgrades. Recent integrations such as native USDC support and Circle's crosschain Transfer Protocol (CCTP) v2 further solidify Sonic's liquidity foundations. Being the first high-performance blockchain to directly support native USDC, Sonic theoretically can support more than \$28 billion in stablecoin circulation.

CCTP v2 reduces crosschain USDC transfer times to under 2 minutes, cutting gas costs by 76%.

These advancements have substantially improved the efficiency and security of stablecoin flows, laying a robust foundation for future ecosystem expansion. We have summarized the following three strategies and their corresponding hedging strategies for readers based on mining strategies tested and researched by multiple DeFi farmers, including Bankless.

4.2 Strategy 1: Silo v2 Loop Lending for High-Leverage Rewards

Among the most popular and straightforward strategies currently available, users can stake \$S or convert other tokens into stS via DEXs, then deposit these into Sonic's primary lending protocol, [Silo v2](#), specifically the S/stS market.

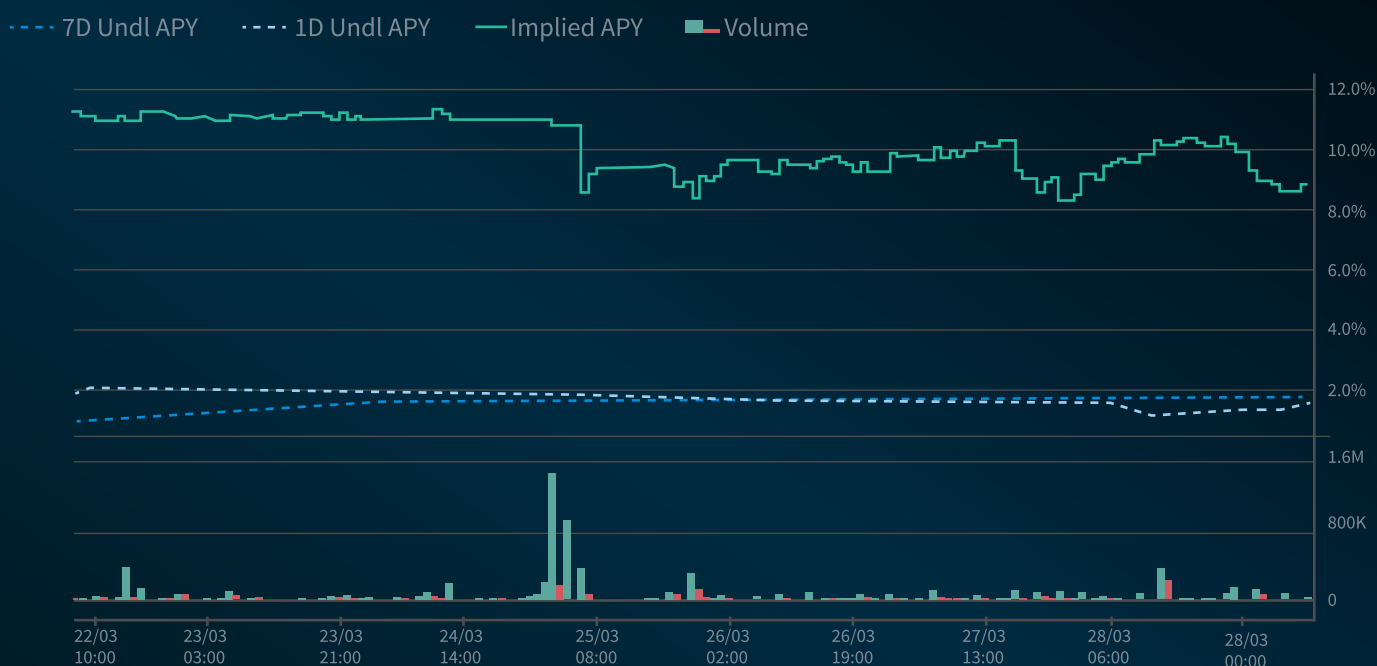
This process enables users to earn Sonic points, Silo (Gems) points, and basic yield (with stS staking yielding approximately 5% APY, plus additional deposit APY provided by Silo).

Users then borrow S using stS as collateral, exchange borrowed S for more stS and repeat the cycle. Given the high correlation between S and stS prices, the Loan-to-Value (LTV) ratio can be increased up to around 95%, allowing leverage up to 20x.

Each dollar of stS deposited can generate up to 8x Sonic points and 20x leveraged Silo points alongside stable yield spreads (Figure 7).

If borrowing rates rise too high, users can reverse the loop (depositing S and borrowing stS). This strategy also works on Euler Finance, although Euler's simpler implementation caps leverage at 10x, suitable for beginners seeking ease of use.

FIGURE 7: SECONDARY MARKET PRICING AND YIELD DYNAMICS OF PT wstkeUSD TOKENS



Source: [Pendle Finance](#)

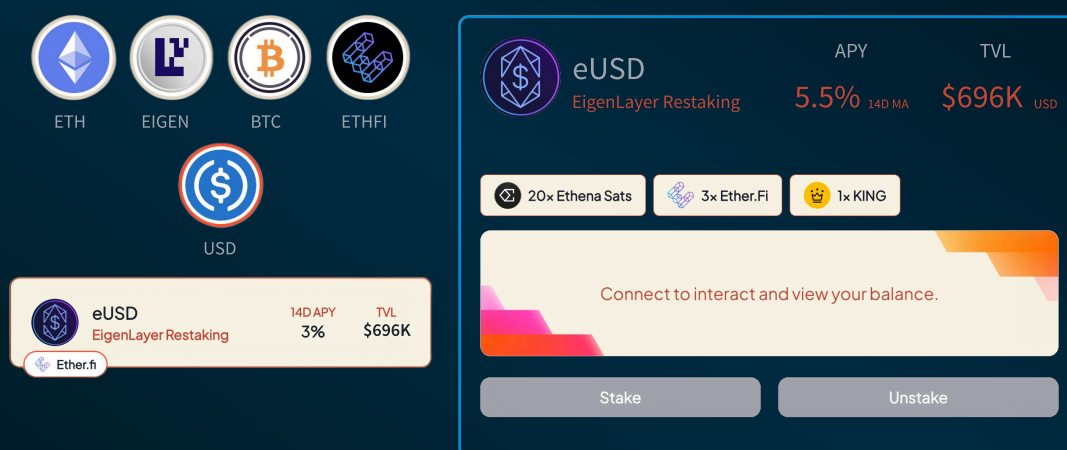
4.3 Strategy 2: Euler + Rings Protocol Combo for Multi-platform Rewards

As the “Stablecoin Hub” of the Sonic ecosystem, Rings Protocol utilizes Veda Labs’ Boring Vaults to aggregate crosschain yields. Users deposit USDC into Rings, minting overcollateralized stablecoin scUSD (approximately 3.7% APY), which can be further staked to generate interest-bearing tokens like stkscUSD (around 5.5% APY), locking in base yields and earning double Sonic point rewards eligible for future \$S token airdrops.

Leveraging Euler’s Multiply feature, users can convert assets like USDC and ETH into Rings derivative tokens (e.g., scUSD, stkscETH, wstkscUSD), then participate in Euler’s highly correlated markets (such as scUSD/wstkscUSD or scETH/wstkscETH) to achieve up to 10x leveraged returns.

This integrated approach combines stable yield, multi-token incentives, and anticipated future airdrops, making it one of Sonic’s most lucrative and efficient strategies for capturing airdrops (Figure 8).

FIGURE 8: STAKING INTERFACE FOR EUSD ON VEDA WITH EIGENLAYER RESTAKING AND MULTI-PROTOCOL REWARD BOOSTS



Source: [Veda.tech](https://veda.tech)

4.4 Strategy 3: Shadow DEX Liquidity Provision for Fees and Reward Points

Shadow, the most active DEX on Sonic, facilitates significant trading activity, especially involving the S/stS pair. Users providing liquidity to these pools earn high-frequency transaction fees, SHADOW token incentives, Sonic points, and Gems rewards.

By setting the most aggressive price ranges—made feasible due to the high correlation

between S and stS—users currently can achieve approximately 169% APR and a 16x multiplier on Sonic points.

Additional tools such as [vfat.io](#) allow for automated LP management and compounding, significantly enhancing capital efficiency. Although this strategy offers high efficiency, it requires proficiency in liquidity management, making it ideal for more experienced users.

4.5 Risk Hedging: Protecting Gains from Market Volatility

Given that these strategies involve volatile assets like S and ETH, it's advisable to hedge against potential market downturns.

Users can open 1x short perpetual positions on Sonic-native Vertex Protocol or HyperliquidX on Arbitrum, thereby mitigating losses if spot prices fall. Users should closely monitor funding rates and remain mindful of potentially forfeiting profits in rising markets.

4.6 Ecosystem Outlook

Sonic's stablecoin ecosystem has introduced innovative yield models, offering investors critical refuge and returns during the current bear market and opening new growth avenues for layer-1 blockchain ecosystems. In the short term, Sonic's integration of official USDC support, deployments by blue-chip protocols like Aave, and specialized DeFi modules such as Pendle and Silo, have established an initial sustainable growth flywheel, seamlessly combining technical performance, economic modeling, and incentive mechanisms.

This approach enhances capital retention and compounded interest accumulation, attracting institutional and risk-averse capital inflows. Sonic's next phase reportedly includes expanding its stablecoin ecosystem into real-world assets (RWA) and payment solutions.

With Circle's cooperation, Sonic aims to integrate compliant real-world asset yields, bringing real interest rates onto the blockchain and providing robust backing for stablecoins. Consequently, future stablecoin investors on Sonic may benefit not only from blockchain-native interest rates but also from returns linked to bonds, credit, and other traditional financial instruments.

Additionally, Sonic Pay is promoting onchain payment solutions, allowing users to use USDC for everyday transactions with transaction fees as low as 0.3%. As usage scenarios and user participation expand, stablecoin demand and frequency of use will likely rise, further reinforcing the Rings stablecoin pools and overall yield ecosystem.

5. Sonic's Innovations in DeFi Infrastructure

Andre Cronje has personally spearheaded the development of Flying Tulip, a next-generation decentralized exchange (DEX) for Sonic, with the goal of achieving significantly higher capital efficiency and improved liquidity aggregation.

Flying Tulip positions itself as an integrated, one-stop DeFi platform, integrating trading, liquidity pools, and lending features, and unifying spot, leveraged, and perpetual trading into a single Automated Market Maker (AMM) protocol to overcome the liquidity fragmentation issues prevalent today.

5.1 Core Mechanism: Adaptive AMM Curve

FlyingTulip's primary innovation is its unique Adaptive AMM curve, inspired by Curve

v2 but enhanced with distinct improvements, especially regarding update triggers.

5.1.1 Brief Review of Curve V2

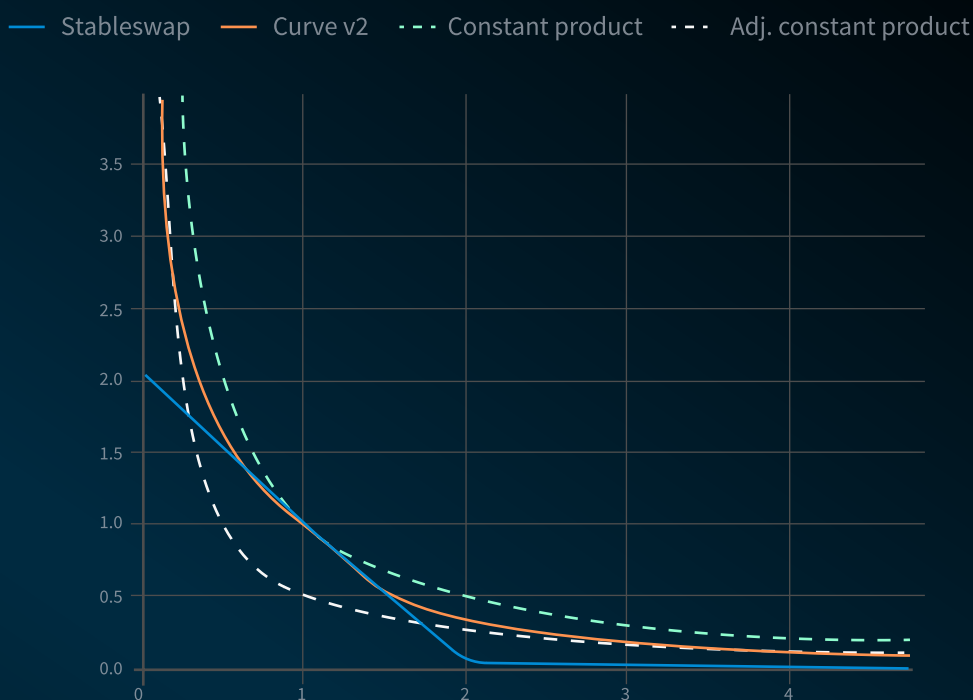
Curve v2 adopts a fundamental philosophy very similar to Uniswap v3—concentrating liquidity around an equilibrium point.

Neither system relies on external price oracles to establish this equilibrium; instead, both depend on internal market dynamics through traditional AMM trading interactions.

In Uniswap v3, this involves professional liquidity providers (LPs) continuously adjusting their price ranges to follow market fluctuations, whereas

Curve v2 uses a mechanism termed the "internal oracle" to achieve a similar equilibrium internally (Figure 9).

FIGURE 9: BONDING CURVE COMPARISON OF AMM INVARIANTS



Source: [Substack /@nagaking](#)

The core innovation in Curve v2's mathematical model is the creation of a novel liquidity curve. Visually, as shown in Figure 9 above, the two dashed lines represent traditional constant-product curves ($X*Y=K$), the blue line represents Curve v1's well-known stablecoin exchange curve, and the orange line illustrates the newly designed Curve v2 curve, which has two distinctive characteristics:

1. It is positioned between the constant-sum curve ($X+Y=K$) and the constant-product curve ($X*Y=K$).
2. Its tail closely approximates a constant-product curve.

This innovative design addresses two critical challenges. First, it inherits Curve v1's key advantage of extremely low slippage and concentrated liquidity around the equilibrium point. Second, by positioning itself between the constant-sum and constant-product curves and aligning closely with the constant-product curve at its tails, it gains the rapid liquidity responsiveness of a constant-product curve, effectively preventing pool liquidity depletion and allowing flexible reactions to swift market movements (Figure 10).

In addition, Curve v2 introduces another significant innovation—the internal oracle-repegging mechanism. Curve v2 implements a price measurement known as **price_scale**. For example, consider a pool containing two assets, USDT and B_token, with a balance of $\mathbf{b} = [1000, 500]$ and an exchange rate of $\mathbf{1\ B} = \mathbf{2\ USDT}$. The corresponding price vector would thus be $\mathbf{p} = [1, 2]$. Multiplying these together yields a scaled balance: $\mathbf{x} = [1000, 1000]$.

FIGURE 10: ASSET HOLDINGS TO BONDING CURVES AND PRICES FORMULA

$$x_i = b_i * p_i$$

Source: [Jinse](#)

As shown in Figure 11 below, at the equilibrium point, the elements within the scaled-balance vector are equal,

which demonstrates the characteristic of a constant product curve.

FIGURE 11: EQUILIBRIUM CONDITIONS FOR ASSET BALANCES AND INVARIANT SATISFACTION IN A DYNAMIC PEGGED AMM

$$X_{eq} = (x_{eq}, x_{eq}, \dots),$$

$$I(X_{eq}, D) = 0,$$

$$D = Nx_{eq}.$$

Source: [Curve DAMM Pool Whitepaper](#)

As market exchange rates fluctuate, swaps occur, and LP behavior influences the system, the coordinate point gradually deviates from the

original "equilibrium point." The AMM curve transitions from an $X + Y = K$ shape toward an $X * Y = K$ shape, which reduces the concentration of liquidity and introduces impermanent loss.

To address this, Curve v2 introduces the Market Price Update mechanism. This system continuously tracks the internal exchange rate movements using a classic

internal oracle method—exponential moving average (EMA)—and, after each trade or LP action, updates a variable called X_{cp} (profit metric) based on the current **price_oracle** (Figure 12).

FIGURE 12: CALCULATION OF PORTFOLIO VALUE AND PROFIT ADJUSTMENT

The value of the portfolio is represented with the value of the constant product invariant at equilibrium:

$$X_{cp} = \left(\prod \frac{D}{N p_i} \right)^{\frac{1}{N}}$$

$\text{virtual_price} := X_{cp} / \text{LP_supply}$

On virtual price changes, the profit is updated as:
 $\text{profit} \leftarrow \text{profit} * \text{new_virtual_price} / \text{old_virtual_price}$

Source: [Jinse](#)

This variable can be understood as a measure of how far the current price has deviated from the original equilibrium point.

Essentially, if the exchange rate fluctuates only slightly, the system continues to use the original equilibrium as the base for its formula.

However, if the deviation is significant, meaning the coordinate on the curve shifts substantially, the system should rebuild the formula by establishing a new equilibrium reference point. This helps reduce impermanent loss and re-concentrate liquidity. The Xcp variable quantifies when it is appropriate to update the formula and reset the equilibrium.

5.1.2 Flying Tulip's Optimization and Upgrades

FlyingTulip significantly enhances the Curve v2 model by shifting the trigger for updating equilibrium points from the internal accumulation of price deviations (Xcp) to external oracle-driven price volatility updates.

As mentioned above, when Xcp surpasses a certain threshold, the system uses the latest oracle price to update the price_scale, which repositions the curve's new equilibrium point. It then updates the new D value to generate a new curve expression.

Consequently, the originally fixed Curve V1-like curve dynamically adjusts its equilibrium based on significant onchain price shifts, ensuring that maximum liquidity remains concentrated around the prevailing market rate, effectively countering arbitrage and minimizing impermanent loss.

Rather than requiring substantial internal trading volume to activate the liquidity reallocation mechanism, FlyingTulip rapidly adjusts liquidity concentration directly based on externally provided volatility data.

In stable markets, FlyingTulip's curve approximates a constant sum curve ($X+Y=K$), whereas in highly volatile markets, it transitions toward a constant product curve

($X*Y=K$). The protocol continuously monitors real-time volatility (rVOL) and implied volatility (IV) through oracles.

5.2 Comparison with Curve V2

FlyingTulip's external oracle-triggered model has two notable advantages over Curve v2's internal accumulation-triggered model:

1. **Faster equilibrium updates:**

When market prices shift, FlyingTulip swiftly relocates liquidity concentration, significantly reducing impermanent loss. For example, when ETH moves from \$2,000 to \$2,100, FlyingTulip requires only about \$500K in trading volume to recalibrate equilibrium points, whereas Curve v2 requires approximately \$1 million.

2. Limited asset range: FlyingTulip relies on external oracle feeds for price updates, restricting its use primarily to assets with reliable external price data and favoring mainstream blue-chip assets rather than long-tail altcoins or memecoins.

5.3 AMM-Based Dynamic LTV Lending Model

FlyingTulip's other key innovation is an AMM-based lending model inspired by Curve's LLAMMA mechanism used to issue crvUSD.

5.3.1 Overview of Curve's LLAMMA Model

crvUSD is issued through the LLAMMA (Lending-Liquidating Automated Market Maker Algorithm), which fundamentally redefines how stablecoin lending and liquidation work. In traditional stablecoin systems, users deposit collateral into a vault, and once the asset price hits a liquidation threshold, forced liquidation is triggered. In contrast, crvUSD uses the LLAMMA model to execute a more fluid, AMM-based liquidation process.

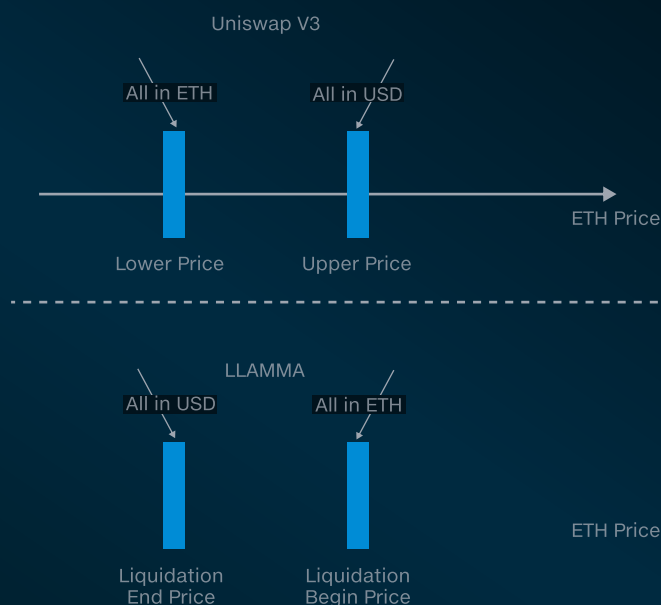
LLAMMA's liquidation mechanism can be understood as a reverse version of Uniswap v3. Imagine an AMM handling the ETH-USD trading pair (in LLAMMA's case, it's ETH-crvUSD, hereafter referred to as USD). In Uniswap v3, liquidity providers (LPs) select a price range for ETH. When ETH trades within this range, the AMM holds both ETH and USD, allowing for swaps. Outside this range, the AMM only contains one of the two assets.



LLAMMA applies a similar principle: When the price of ETH is above a user's liquidation range, the AMM holds only ETH; as the price enters the range, ETH is gradually converted to USD—effectively initiating a soft liquidation process.

The difference is in how the pool behaves. In Uniswap v3, the higher the ETH price, the more USD the pool contains. In LLAMMA, it's the opposite: the lower the ETH price, the more USD is present because the AMM needs to sell ETH to repay the debt. If the ETH price increases again, the AMM buys back ETH using USD, helping the user regain their exposure without any manual intervention (Figure 13).

FIGURE 13: COMPARISON OF ASSET CONVERSION RANGES IN UNISWAP V3 VS. LLAMMA FOR ETH PRICE MOVEMENTS



Source: [Curve Technical Docs](#)

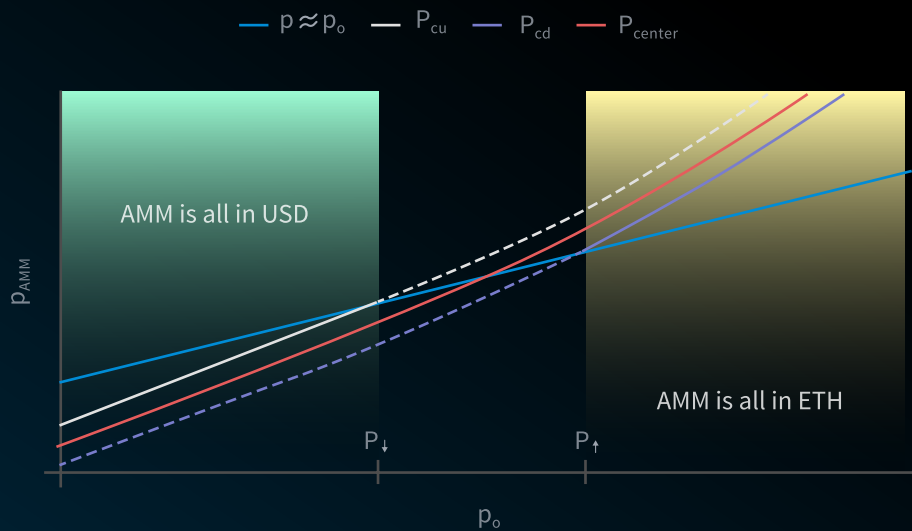
Since LLAMMA operates within a defined price range, it requires users to input three parameters when borrowing crvUSD: the amount of collateral, the loan amount, and the number of Bands. Bands function similarly to ticks in Uniswap v3 and determine the price range width.

From the collateral amount, loan-to-value ratio (LTV), and borrowed amount, LLAMMA calculates the lower bound of the price range (P_{cdP}).

Then, based on the number of Bands, it derives the upper bound (P_{cuP}), forming the full liquidation curve.

When a user borrows crvUSD, Curve maps their position along the LLAMMA curve according to these parameters. As the external ETH price (P_{0P}) declines and approaches the upper bound (P_{cuP}), the ETH-crvUSD AMM begins executing trades: crvUSD is used to buy ETH, thus starting the soft liquidation. Arbitrageurs participate by buying ETH with crvUSD, reducing the user's exposure. If the price drops below P_{cdP} , the user's position is fully liquidated (Figure 14).

FIGURE 14: RELATIONSHIP BETWEEN AMM AND ORACLE PRICES ACROSS ASSET ALLOCATION RANGES UNDER A DUAL-ASSET LIQUIDITY MODEL



Source: [Curve Technical Docs](#)

The benefit of soft liquidation is that it's reversible: if ETH's price rebounds, arbitrageurs sell ETH back into crvUSD, enabling the AMM to buy back ETH and restore the user's collateral. This entire process is automated by LLAMMA without requiring any user action.

Additionally, during high trading volume, the swap fees generated during liquidation can offset some of the interest costs of the loan—adding another layer of efficiency for borrowers.

5.3.2 Flying Tulip's Dynamic LTV Model

Flying Tulip adopts an AMM-based LTV model, which, although not fully disclosed in detail, likely operates on principles similar to the LLAMMA mechanism used by Curve.

In Curve, lending is facilitated through the issuance of crvUSD, while in Flying Tulip, users borrow the counter asset within a trading pair.

Unlike traditional lending platforms that use fixed system-wide LTV parameters, Flying Tulip dynamically adjusts the Loan-to-Value (LTV) ratio based on volatility data provided by oracles.

For example, if a user deposits 1 ETH (worth \$2,000) as collateral, several scenarios may arise:

1. In a low-volatility market, the user might be able to borrow up to \$1,600 (80% LTV).
2. In a high-volatility market, the same collateral may only allow borrowing of \$1,000 (50% LTV).
3. If the collateral-to-market-depth ratio is unusually high, the system may further limit borrowing to \$900 (45% LTV).

This dynamic LTV mechanism helps protect both the platform and its users by reducing systemic risk during periods of market turbulence. It ensures the protocol remains solvent while minimizing the likelihood of cascading liquidations.

5.4 Competitive Advantages and Risks

Flying Tulip claims to outperform other AMM protocols with the following advantages:

- 42% reduction in impermanent loss
- 9x increase in LP returns
- 85% improvement in capital efficiency

These figures appear credible when considering the protocol's innovations—its adaptive AMM curve and dynamic LTV model.

Liquidity providers (LPs) benefit not only from standard spot trading fees but also from interest income on lending, fees generated during soft liquidations, and more. As a result, capital utilization is pushed to its limit.

However, all of Flying Tulip's innovations built on Curve v2 rely heavily on oracle-based price feeds. If the AMM receives faulty or manipulated volatility data from the oracle, the LPs participating in the protocol could be exposed to significantly greater impermanent losses.

6. Summary and Outlook

From a macro perspective, Sonic is poised to become a formidable contender in the anticipated DeFi revival wave of 2025. Its thriving stablecoin ecosystem has created significant upside potential for both its native token S and the overall network value.

Currently, Sonic's market cap-to-TVL ratio remains relatively low, suggesting that its rapidly growing locked value has yet to be fully reflected in its valuation, which implies strong potential for a re-rating. If the current growth trajectory holds, Sonic's total onchain TVL could surpass \$2 billion within the next 12 months, representing an annualized growth rate of approximately 150%.

In that scenario, the market cap of its governance token S could reach the multibillion-dollar range, placing its

ecosystem status and investor recognition close to that of Sui, the breakout L1 of 2024.

More importantly, Sonic is championing an "efficiency revolution" in blockchain design, prioritizing performance and capital efficiency over speculative hype to attract liquidity. In an environment of tightening regulation and increasingly rational investors, this pragmatic model may define the next phase of competition among L1s.

Sonic's nested stablecoin yield architecture also puts a critical thesis to the test: Can DeFi build true "yield fortresses" during bear markets through clever mechanism design, offering a safe haven for capital to weather market cycles? If Sonic proves this model viable, it is likely that other L1s and L2s will rapidly adopt similar stablecoin plus yield strategies, potentially sparking a new arms race centered around onchain yield generation.

About HTX Research

HTX Research is the dedicated research arm of HTX Group, responsible for conducting in-depth analyses, producing comprehensive reports, and delivering expert evaluations across a broad spectrum of topics, including crypto-currency, blockchain technology, and emerging market trends. Committed to providing data-driven insights and strategic foresight, HTX Research plays a pivotal role in shaping industry perspectives and supporting informed decision-making within the digital asset space.

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References List

- 1) <https://docs.soniclabs.com/technology/consensus>
- 2) <https://blog.fantom.foundation>
- 3) <https://d.foresightnews.pro/article/detail/82029>
- 4) <https://veda.tech/>
- 5) <https://www.reddit.com/r/FantomFoundation/>

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