Sonic
Report

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Introduction

The Fantom Opera network upgrade in Q2 2024 marked a pivotal progression for the original Fantom network. Initially launched to solve the notorious blockchain trilemma—balancing decentralization, security, and scalability—Fantom has been widely adopted for its consensus mechanism, Lachesis, which allows the network to process transactions asynchronously and achieve high throughput with finality in under one second. The Opera upgrade was the first step of a much grander transition.

Now, Q4 2024 will officially launch an entirely new blockchain and token, the Sonic chain and S token (Providing a 1:1 swap for FTM holders at genesis). Together, these two will create a high-performance Layer-1 blockchain with the Fantom community, featuring scalable architecture, sub-second finality, Ethereum connectivity, low transaction costs, airdrops, and more. The Sonic chain will deliver cutting-edge infrastructure designed to meet the growing demands of DeFi, cross-chain consumer dApps, NFTs, and other high-frequency applications, helping kick off a modernized Sonic ecosystem with top crypto brands like Chainlink, Pyth, Alchemy, and more.

Why Sonic?

The existing Fantom Opera network has proven highly efficient, but as blockchain demands increase, its limitations have become more apparent. Rather than simply enhancing the current network, the decision to launch the new Sonic blockchain introduced a more robust solution capable of handling the exponential growth in demand for cross-chain dApps, DeFi, NFTs, and beyond. This entirely new chain will deliver a host of improvements explicitly designed to address network congestion, reduce costs for node operators, and increase transaction throughput.

Why create Sonic instead of continuing with Opera?

The technological advancements we achieved with our Sonic technology could not be fully integrated into Opera through a simple soft-fork upgrade. Therefore, we decided to launch an entirely new network with a new token, allowing us to usher in the next era of L1 blockchain innovation.

The benefits include:

- 10x faster node synchronization compared to Opera

- 66% reduction in validator node costs compared to Opera

- Live-pruning capabilities for nodes

- Much smaller database size

- Up to 96% reduction in costs for operating large-scale RPC nodes

- Sub-second transaction finality

- Fully compatible with the Sonic Gateway

Sonic addresses Opera's limitations by introducing a comprehensive set of architectural advancements that significantly enhance Fantom's throughput, efficiency, and resilience.

First, Sonic increases the network's transaction processing capacity and optimizes its operational performance without relying on more complex scaling solutions like sharding or L2 rollups. By implementing a shard-free, single-layer architecture, Sonic maintains the existing network's simplicity and robustness while pushing its scalability to new levels.

Unlike many Layer-1 solutions that rely on complex scaling solutions like sharding or Layer-2 rollups, Sonic maintains a shard-free, single-layer architecture that prioritizes simplicity and resilience, unlocking powerful benefits for developers and users alike. This new blockchain positions Fantom to compete directly with high-performance Layer-1 solutions like Solana and Avalanche.

General

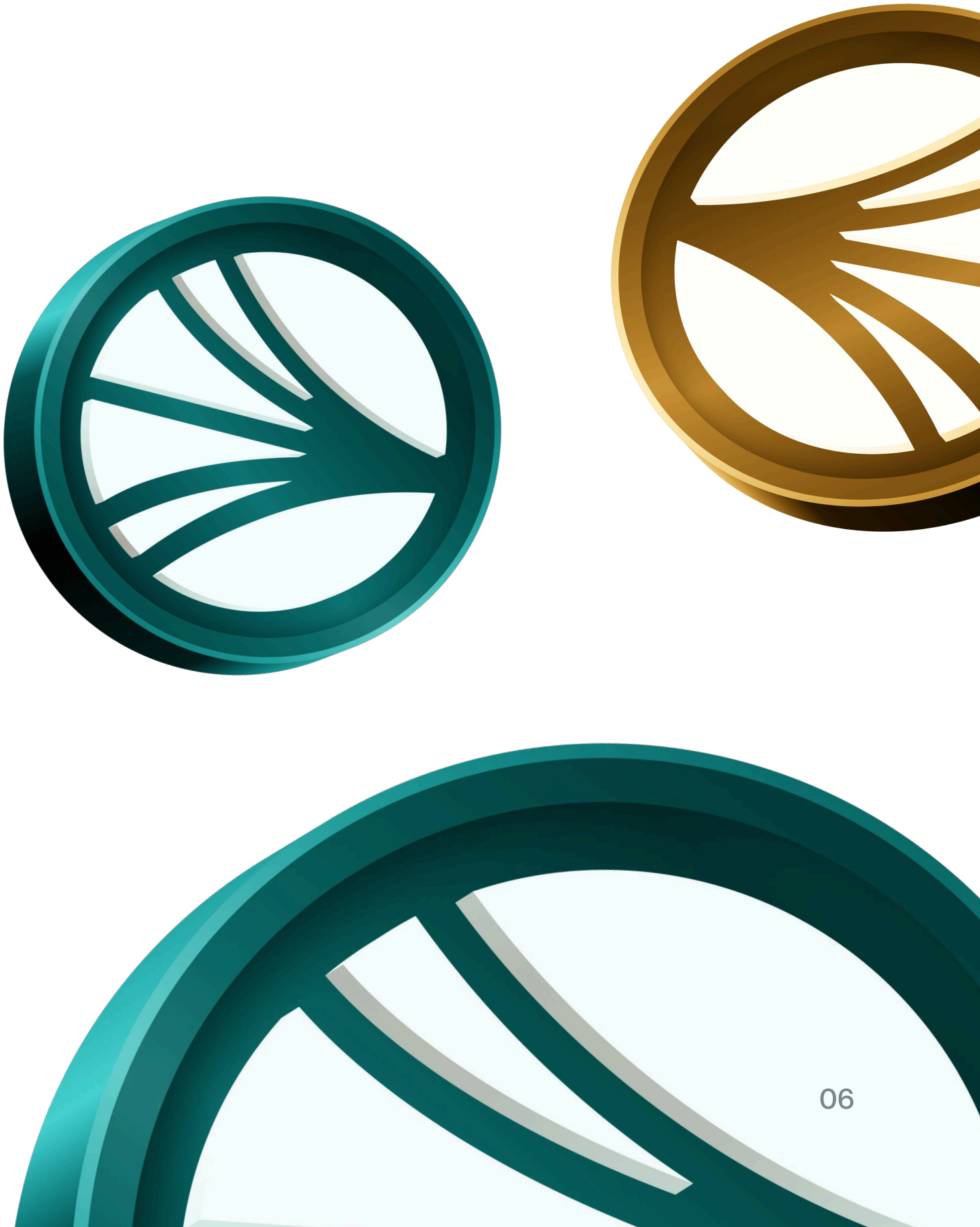|	Sonic (Carmen Schema 3)	Opera (1.1.2-rc.6)
Minimum Consensus Quorum	15	14
Validators' Stake Share	Equal	Naturally distributed
Peak Gas per Day (Billion)	34,560	283.96
Peak Gas per Second (Million)	405	3.28
Peak Transactions per Second	2,100	21
Archive Node DB Size (GB/100M Tx)	180	2,106
Archive Node DB at 518M Tx (GB)	1,000	10,893
Live Pruned DB Size at 518M Tx (GB)	351	1,904
Offline Pruned DB Size (GB)	N/A	1,194

Validators

	Sonic (Carmen Schema 3)	Opera (1.1.2-rc.6)
Live Pruning Support	00000	00000
Minimum Offline Pruning Downtime w/ Standby Node	None	30 mins
Full Offline Pruning Downtime	None	3-8 hours
Validator Hardware Cost	Low	Higher
Validator Operating Cost	Low	Higher
Validator Operating Risk	Low	Higher
Average Offline Pruning Period (Day)	None	166
DB Size Growth Rate (GB/Day)	0.74	17.78
Time to Full Sync	< = 2 days	< = 4 weeks

The migration to Sonic involves several phases designed to ensure a smooth transition for the existing Fantom community:

1. Token Swap and Governance: Existing FTM token holders will participate in a 1:1 token swap to exchange their FTM tokens for the newly introduced S tokens, which will power the Sonic network. This has been officially passed through four strategic governance votes within the Fantom community, all of which received over 90% approval.

2. Partnerships and Incentives: The chain is launching its partnerships with an Innovator Fund worth more than $ 100 million today. The Fantom Foundation has secured key partnerships to support the launch of Sonic, including collaborations with major Web2 and Web3 entities such as Alchemy, Gelato, Pyth, and Chainlink, among others. In addition, the foundation has allocated millions of FTM from its treasury to fund various initiatives, including developer grants, business development, and liquidity incentives for early adopters of the Sonic ecosystem.

3. Airdrops and Developer Programs: As part of the launch strategy, a portion of the newly minted S tokens will be distributed through airdrops, rewarding both existing users of the Fantom Opera network and attracting new participants. As of today, this airdrop is worth over 110m USD and introduces a unique linear burn and vesting mechanism to reduce the effect of supply. This airdrop will also coincide with the launch of several developer programs, including grants, hackathons, and educational initiatives under the Sonic University banner, to foster innovation and grow the developer community on the new platform.

The Fantom-to-Sonic transition comes at a time when the blockchain industry is witnessing a wave of Layer-1 network upgrades. From Ethereum's shift to proof-of-stake with Ethereum 2.0 to the introduction of new token models in networks like Polygon 2.0, major blockchain ecosystems are recalibrating their technical foundations to better accommodate the demands of decentralized applications and services. Sonic's emphasis on throughput, combined with its streamlined architecture, positions Fantom as a formidable competitor in this race for scalability and performance, setting the stage for Fantom's evolution into a next-generation blockchain capable of supporting a wide array of use cases—from DeFi to gaming to Internet of Things (IoT).

Technological Changes

Sonic Virtual Machine (SVM)

Sonic's virtual machine (VM) is a key component of the Sonic blockchain, facilitating elevated efficiency, performance, and compatibility with the wider DeFi ecosystem and existing EVM products. At its core, the VM is engineered to enhance the speed at which smart contracts are executed substantially. Sonic's VM is distinctive because it can convert EVM bytecode into a more optimized format without requiring extensive rewrites of existing smart contracts. This means that developers accustomed to building on Ethereum can migrate their dApps to Sonic effortlessly, ensuring that the network attracts a wide range of Ethereum-based projects.

In practice, Sonic's VM removes performance bottlenecks related to contract execution by using more efficient resource management and a simplified virtual execution environment. It retains compatibility with Ethereum-based Solidity contracts, allowing developers to deploy without making drastic changes to their codebase. This strategic compatibility reduces friction, making Sonic a more attractive platform for DeFi applications and other projects that depend on high transaction throughput.

Sonic Data Storage

Sonic's new StateDB storage solution features live pruning, dynamically reducing the blockchain's historical data footprint and addressing the inefficiencies and operational costs associated with an ever-growing ledger. This process ensures the blockchain remains lean and scalable, preventing data bloat that can slow down performance as the network expands.
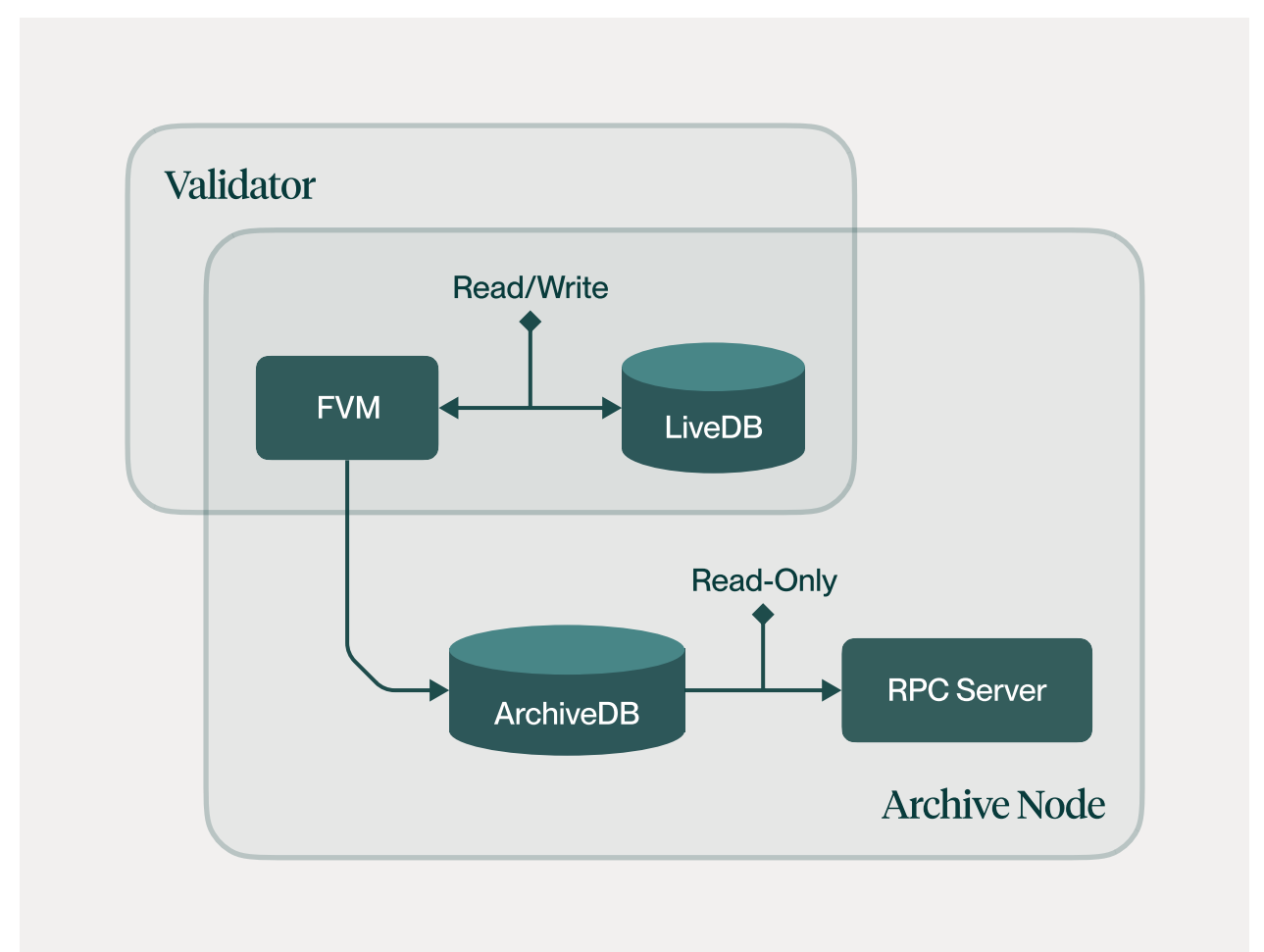
Live pruning operates by dividing the database into two components: the LiveDB, which stores the current state of the Sonic network, and the ArchiveDB, which holds the historical data. Validators only need to maintain the LiveDB, while archive nodes are responsible for syncing and storing both the current and historical states.

This dual-database architecture significantly improves network synchronization speeds by reducing the storage burden on validators. As a result, this storage solution enhances the blockchain's overall performance, enabling faster transaction processing, more efficient data management, and an improved user experience as the network scales to accommodate more users and transactions.

Finality

Sonic introduces significant enhancements to transaction finality, enabling near-instantaneous confirmation times. Time to finality refers to how long it takes for a transaction to become irreversible on the blockchain. In contrast to probabilistic finality models used by networks like Bitcoin and Ethereum, which require multiple blocks to ensure transaction immutability (about an hour for Bitcoin and two minutes for Ethereum), Sonic achieves deterministic finality in under one second.

This is made possible through Sonic's consensus mechanism, which eliminates the need for the longest chain rule and chain reorganizations. Instead of relying on a single computer to produce blocks sequentially, transactions on Sonic are confirmed once a majority of validators reach consensus, ensuring there is no chance of conflicting blocks or delays. As a result, once a block is added, it is immediately final and irreversible, providing superior security, efficiency, and user experience compared to traditional blockchain finality models.

Sonic Gateway: A Bridge to Ethereum

Sonic is an L1 chain that leverages a bespoke L2 bridge (Gateway) to connect seamlessly with Ethereum, creating a form of hybrid L1-L2 that combines the high-speed, low-cost benefits of L1 with the security and liquidity access of Ethereum's L2. It also enables Sonic to connect to the billions in TVL currently sitting in Ethereum L2s/rollups.

L2 bridges play a crucial role in modern blockchain ecosystems by addressing two major limitations of L1 chains: scalability and cost. Ethereum, for example, is renowned for its security and vast network of users and liquidity, but it suffers from high transaction fees and slower processing times due to its L1 architecture. This is where L2 solutions come in, designed to offload transaction processing from the L1 mainnet, significantly increasing throughput while reducing costs.

L2 bridges achieve this by handling the bulk of transactions off-chain and periodically settling them on Ethereum's L1. This method reduces congestion and maintains Ethereum's robust security since the final transaction records are anchored back to the main network. Bridges like these connect assets and smart contracts between chains, enabling cross-chain interoperability and greater network synergy without compromising security.

How Layer 2 Bridges Work in Connecting to Ethereum

L2 bridges function by creating a trusted link between Ethereum and an external chain (in this case, Sonic). They allow assets and data to move between the two networks without risking double-spending or trustless transactions. When a user or application interacts with Ethereum through an L2 bridge, the process is as follows:

1. Transaction Aggregation:
   The L2 collects multiple transactions from users and processes them in batches. This reduces the load on the Ethereum mainnet and significantly lowers gas fees.

2. Settlement on Ethereum:
   Once the transactions are processed, the results are sent back to Ethereum, where the Layer 1 network finalizes them. This ensures that the integrity and security of the Ethereum blockchain are upheld while benefiting from L2 scalability.

3. Liquidity and Security:
   The L2 bridge also allows native ETH and ERC-20 tokens to be moved across chains, granting Sonic access to Ethereum's deep liquidity while leveraging Ethereum's mature security model.

Sonic's Gateway is a decentralized and trustless bridge connecting Ethereum and Sonic, utilizing Sonic's validator network. The Gateway ensures secure ERC-20 token transfers while allowing users to maintain complete control over their assets. Transfers from Ethereum to Sonic take up to 10 minutes, and from Sonic to Ethereum, up to 1 hour. A built-in fail-safe lets users recover their assets on Ethereum if the Gateway is unresponsive for 14 days. Unlike layer-2 solutions that require a 7-day challenge period for finalization, Sonic Gateway provides quicker and more secure transfers without relying on multi-signature bridge protection.

By integrating this L2 bridge with Ethereum, Sonic provides direct access to native ETH and other assets on Ethereum, eliminating the need for costly and time-consuming third-party intermediaries. This connection enables Sonic to leverage Ethereum's liquidity pools, DeFi protocols, and user base, while maintaining the low fees and high throughput characteristics of Layer 1 platforms.

Valour S SEK

Valour Sonic (S) SEK is an exchange-traded product (ETP) tracking S, the native token of the Sonic Network. Sonic is a decentralized platform designed for faster, more secure, and fee-optimized transactions, aimed at enhancing financial accessibility and interoperability. The S token is used for payments, staking, and governance, allowing holders to influence decisions regarding the platform's development and future. By enabling lightning-fast transactions and supporting various applications in DeFi and the digital economy, Sonic fosters innovation and decentralization.

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