Solana VS Areweave: Storing and Manipulating Data in Blogging Sites

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Introduction

In an era dominated by digital innovation, the need to store and exchange information securely is at an all time high. Many solutions exist, however; blockchain technology has emerged as a key player - namely the Solana and Arweave blockchains.

To test which of these blockchain storage solutions was the best, we looked at the two through the lens of a blogging application - considering factors such as **data permanence**, **transaction costs**, **performance**, and **user interaction**.

Comparison

Solana:

Solana is a high-performance blockchain designed for fast and scalable decentralized applications. With its low transaction fees, Solana is a cost-effective environment for both developers and users. Combining this with extremely fast transaction feeds thanks to a unique consensus mechanism, Solana boasts thousands of transactions per second. In addition to its high performance, Solana ensures resilience, security, and censorship resistance due to its decentralized network of nodes.

Arweave:

Designed to be permanent and tamper-proof, Arweave provides users with a blockchain based storage platform. Users pay a one-time transaction fee for storing data permanently, providing a predictable and upfront cost structure. Arweave utilizes a decentralized network of nodes to ensure data redundancy and availability, enhancing resilience against failures or attacks. Arweave is ideal for use cases requiring archival of important documents, historical records, or any data that needs to be accessible indefinitely. With a growing developer community focused on decentralized data storage, providing tools and resources for easy integration, Arweave proves to be strong solution.

Solana VS Areweave

- Solana:
  - Transactions are recorded in blocks, forming a transparent chronological public ledger for program financial activities.
  - Programs use accounts as file-like structures to store persistent data, facilitating the retention of state information between transactions.
  - Accounts on Solana have a lifespan in fractional native tokens (lamports), requiring rent to stay in validator memory; zero lamports lead to purging, while some accounts may be rent-exempt based on balance.
  - Solana has two account types—executable like smart contracts (immutable) non-executable (owned by entities)
  - Transaction fees compensate validators, deter spam, contribute to economic stability, incorporating a burn mechanism to enhance SOL's value.
  - Drawbacks include limited storage, user experience delays, potential backend centralization concerns.
- Arweave:
  - Arweave's Permaweb on its blockchain offers permanent and globally accessible data storage, emphasizing decentralization and community ownership.
  - Arweave collaborates with the Internet Archive, storing tamper-proof Wayback Machine metadata for a permanent historical record resistant to censorship.
  - Arweave supports user-friendly file storage and introduces Bundlr for dApps, and SmartWeave enables cost-efficient smart contracts with a unique consensus mechanism and one-time fees.
  - Arweave employs dynamic pricing ($3.00 to 8.00 per GB) pegged to USD, influenced by network difficulty, ensuring profitability, sustainability, and potential cost decreases with evolving data storage trends.
  - Drawbacks of Arweave include static data limitations, limited smart contract functionality, read-only data, inability to edit previous posts, comments, etc., and indexing complexity.

Results

Solana:

The most apparent drawback when utilizing Solana was that a centralized host for storage was required, ultimately defeating the purpose of being decentralized. In this scenario Solana was used solely for user interaction (posting, liking, commenting, etc.) and account creation. For a blogging website (Blogger) there is an average of 5,750 blogs per minute, with every post equating to around 2 transactions giving a total of 11,500 transactions per minute. The average price at the time of writing for the calculation we made would be around 0.0989 SOL, or a grand total of 2.75 cents. This is extremely low and completely viable for a blogging site.

Arweave:

On the Arweave side, on average there is 2KB Per Post and an average cost of $5 per GB of data stored on Arweave. With a total of 500000 posts per GB, which is essentially 0.0575 cents per minute. Solana is 47.83 times more expensive than storage on Arweave in this manner.

Testing

Process for testing Solana and Arweave transaction rates and viability:

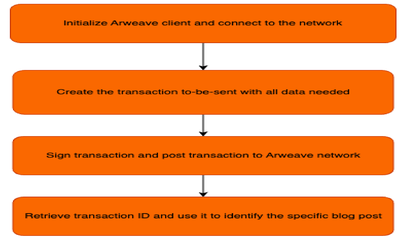

Figure 1. Solana Transaction Process

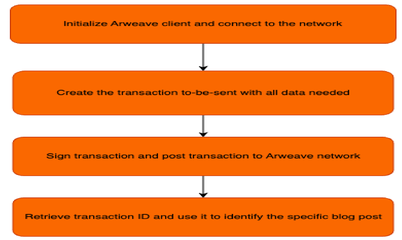

Figure 2. Arweave Transaction Process

Conclusion

Finally, integrating Solana with Arweave provides a solid solution for decentralized blogging. Solana's rapid transactions and cheap costs adapt to dynamic interactions, whereas Arweave's decentralized Permaweb provides permanent data preservation. This complementary approach results in a balanced design that provides consumers with a smooth and cost-effective experience. Using both platforms boosts decentralization by creating a community-driven and resilient environment for a genuinely decentralized blogging service.

References

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