

The State Of Decentralised Storage

2024 report and
2025 predictions

prepared by
codex.storage

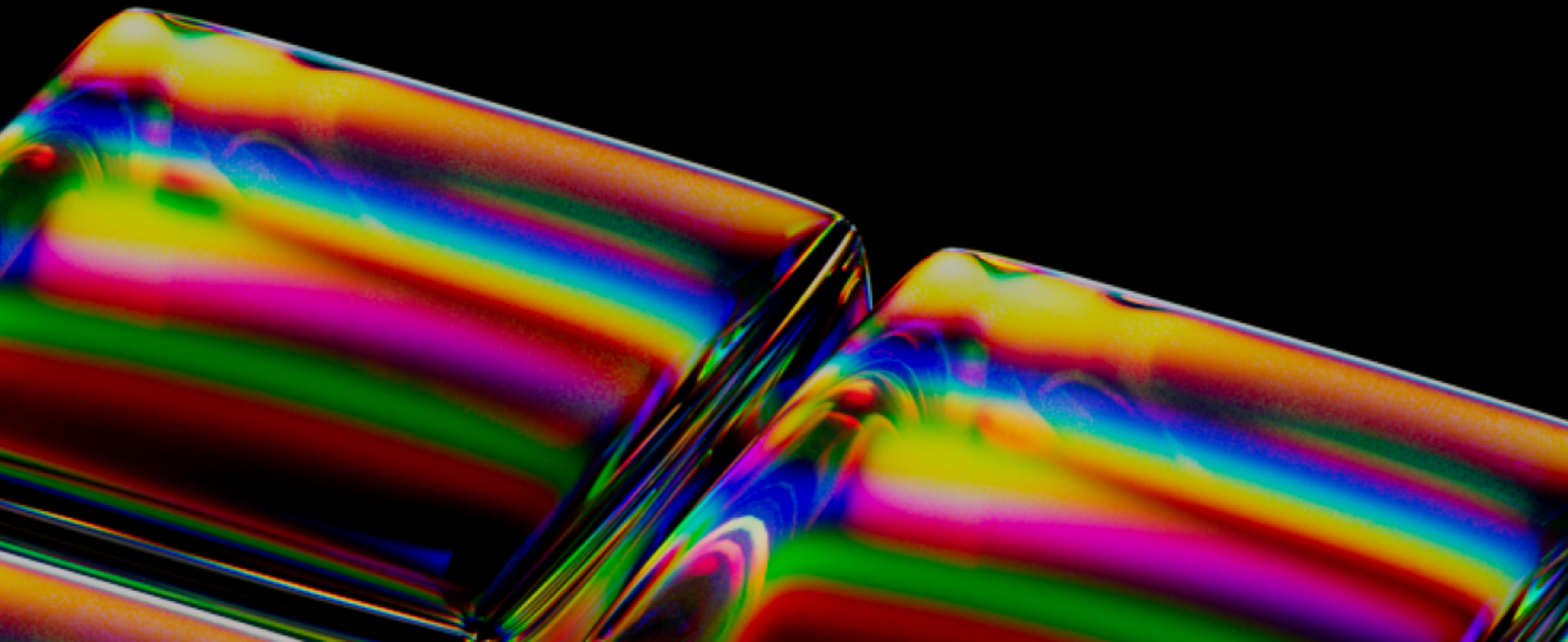
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Executive Summary

In 2024, the decentralised storage space saw substantial evolution and adoption as industries sought alternatives to centralised cloud providers. Driven by increasing data privacy concerns, rising storage needs, and growing mistrust of centralised monopolies, decentralised storage networks (DSNs) have established themselves as critical components of the modern web3 infrastructure.

This report provides a comprehensive analysis of the decentralised storage market for 2024, including emerging trends, competitive dynamics, and key predictions for 2025. It examines leading solutions such as Filecoin, Arweave, Storj, and Codex alongside innovations driving the next phase of growth in the sector.



Market Overview

Decentralised storage networks leverage distributed systems to store and retrieve data securely and efficiently. By eliminating reliance on centralised entities, these platforms offer higher resilience, censorship resistance, and economic incentives for data providers and consumers.

Key Drivers In 2024

- 1** Data Privacy and Control: Decentralised networks allow users to retain data ownership.
- 2** Rising Storage Demands: Global data generation continues to surge, with big data, AI/ML, and IoT driving exponential growth.
- 3** Resilience Against Failures: Decentralised systems enhance redundancy and mitigate single points of failure.
- 4** Web3 Ecosystem Integration: Increasing adoption of blockchain and dapps has fueled demand for decentralised storage solutions.
- 5** Cost Efficiency: Decentralised storage often offers more competitive pricing models than traditional providers like AWS or Google Cloud.

Competitive Landscape

The decentralised storage market is populated by key players competing on scalability, security, cost, and network performance. While the industry remains fragmented, leading solutions have emerged with distinct strengths.

Filecoin

The largest decentralised storage network by market capitalisation, offering incentivised storage through its Proof-of-Replication model. Filecoin's extensive ecosystem and enterprise adoption have solidified its leadership.

Arweave

Arweave's claim of immutable data is underpinned by an economic model rather than its purely block-weave data structure. However, its offering lacks mechanisms to account for download bandwidth costs or repair corrupted or withheld data.

Storj




While Storj positions itself as a decentralised solution, it relies on centralised orchestration. Enterprise client data flows through a single satellite node operated by Storj, which handles data dissemination to qualifying storage nodes at fixed prices. This setup raises concerns about centralisation.

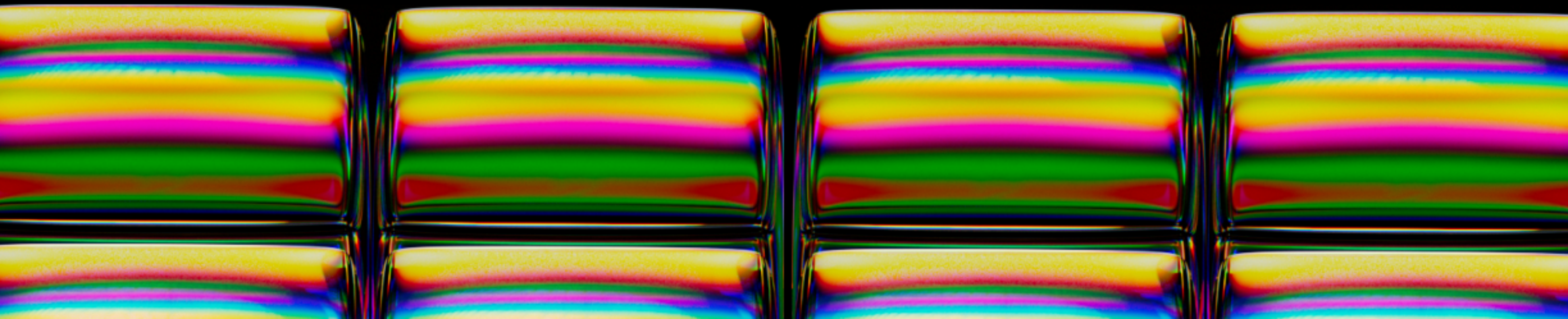
Codex

A rising player that introduces a unique approach to durability, fault tolerance, and performance, offering a strong alternative to established networks.

Comparative Analysis

How Codex is being engineered 'differently' from other decentralised storage networks (DSN)

Description	 Filecoin	 arweave.org	 Codex	Considerations
Robust SDK	Yes	Yes	No	Filecoin and Arweave have more mature SDKs
Redundancy mechanism to ensure efficient data replication	Replication	Replication	Erasure Coding	Codex offers better storage efficiency and fault tolerance. Replication takes more storage space, less computational overhead.
Remote auditing mechanism to ensure stored data is available and accessible	PoRep & PoSt	SPoA+SPoRes	ZK based proofs of data integrity	Codex uses ZK based proof of retrievability (or data possession) for lightweight data durability
Repair mechanism to auto-detect and auto-correct data corruption or loss	PoRep & PoSt	No	Lazy repair	Codex uses a lazy repair mechanism for efficient data reconstruction and loss prevention
Incentive mechanism to encourage reliability across the storage network	Yes	Yes	Yes	Codex incentive mechanism incorporates storage fees, penalty and collateral
Data dispersal mechanism to drive decentralisation and distribution	Replication only - single nodes	Replication only - multiple nodes	Dispersal over multiple nodes	Codex distributes data fragments across multiple nodes to minimise the risk of data loss due to localised failures
Optimised storage cost	\$\$\$\$\$	\$\$	\$\$\$\$	Codex price is comparable to Filecoin
Efficient storage techniques	3-5x	+20x	1.5-2.5x	Actual storage required to store 1TB (x)
Scalability and retrieval speed	Scalable	Faster	Optimal	Codex will be scalable and offer bandwidth incentive (late 2025 or early 2026)



Comparative Observations

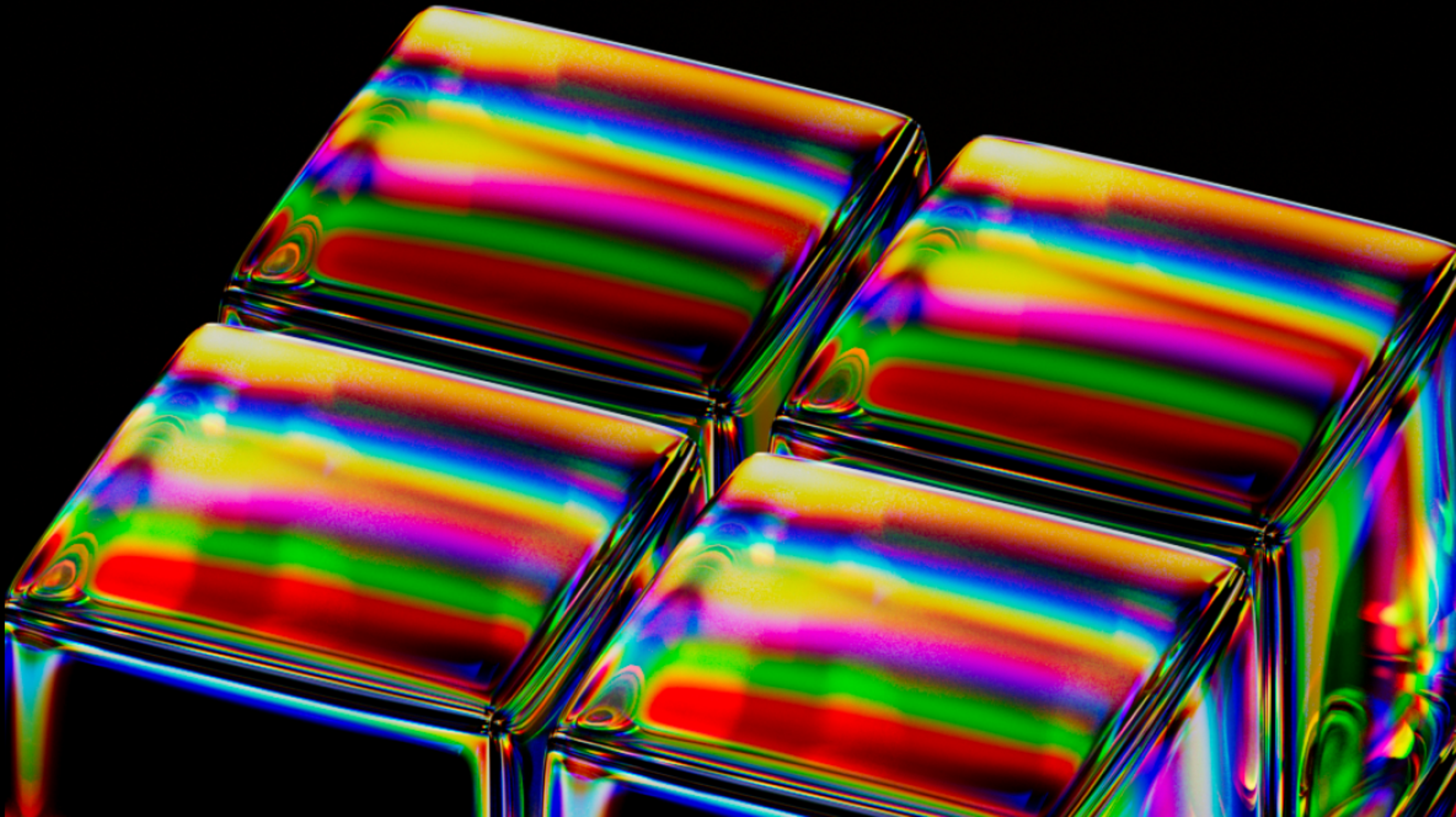
Filecoin and Arweave are currently leading in terms of ecosystem maturity, but Arweave's lack of repair mechanisms and incomplete cost coverage limits its long-term practicality.

Storj's reliance on a centralised satellite node for enterprise data orchestration creates potential single points of failure, questioning its decentralisation claims.

Codex offers better fault tolerance and efficiency with features like erasure coding and lazy repair mechanisms.

Codex distributes data fragments across multiple nodes, minimising localised failures compared to Filecoin's single-node replication model.

Actual storage requirements for Codex are significantly lower (1.5-2.5x) compared to Arweave (+20x) and Filecoin (3-5x), which improves cost efficiency.



2024 Trends

- 1 Enterprise Adoption**

Traditional enterprises are exploring decentralised storage to reduce dependency on centralised cloud giants and improve data resilience.
- 2 Integration with AI and ML**

Decentralised storage networks are increasingly used to store massive datasets required for AI/ML models.
- 3 Permanent Data Archives**

Solutions like Arweave have fueled interest in long-term data storage.
- 4 Multi-chain Ecosystems**

Interoperability between blockchains and storage protocols is improving, driving broader adoption.
- 5 Tokenised Incentive Models**

Storage providers and users are increasingly rewarded through native tokens, improving market participation.
- 6 Hybrid Storage Solutions**

Enterprises are beginning to leverage a combination of centralised and decentralised systems to strike a balance between cost, control, and performance.

2025 Predictions

- 1 Market Expansion**

Decentralised storage will capture a larger cloud storage market share as enterprises seek alternatives to centralised providers.
 - 2 AI-Driven Optimisation**

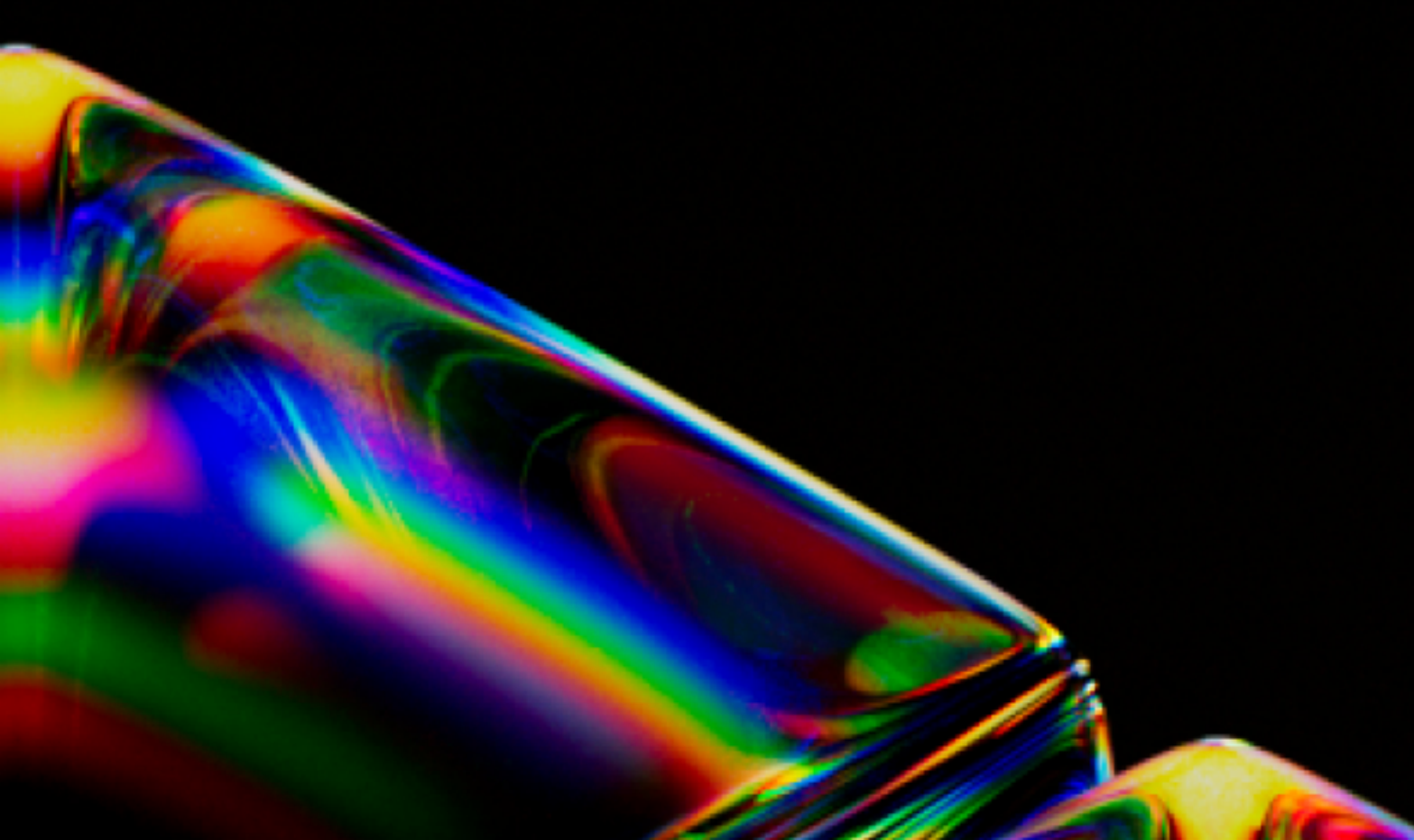
AI-powered tools will improve storage efficiency, fault detection, and network optimisation.
 - 3 Hybrid Cloud Adoption**

More enterprises will adopt hybrid solutions, combining decentralised and centralised storage to meet their diverse needs.
 - 4 Improved Fault Tolerance**

Innovations in fault tolerance, durability, and repairability will become industry standards, enhancing overall reliability.
 - 5 Regulatory Adaptation**

DSNs will adapt to regulatory frameworks like GDPR and HIPAA, driving enterprise and institutional adoption.
 - 6 Decentralised CDN Integration**

The convergence of decentralised storage with decentralised content delivery networks (CDNs) will enable faster and more efficient data access.
 - 7 Cost Competitiveness**

As technology matures, decentralised storage solutions will offer pricing models that challenge traditional providers without compromising performance.
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Conclusion

The decentralised storage market developed rapidly in 2024, with leading solutions like Filecoin, Arweave, Storj, Codex, and other emerging players driving innovation. The sector continues to address critical challenges such as data privacy, redundancy, and scalability while positioning itself as an essential part of the web3 infrastructure.

As we begin 2025, the market is expected to witness greater adoption, technological advancements, and increased enterprise participation. The next growth phase will be defined by hybrid solutions, AI-driven optimisations, and enhanced fault-tolerance mechanisms, setting the stage for decentralised storage to compete effectively with traditional cloud storage providers.





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