Paper Title:

A Secure Big Data Storage Framework Based on Blockchain Consensus Mechanism With Flexible Finality

Paper Link:

https://ieeexplore.ieee.org/document/10143186

1 Summary

1.1 Motivation

The paper proposes a blockchain-based framework to address secure big data storage challenges, ensuring security, scalability, and transparency. Motivated by growing data security concerns and limitations of traditional systems, the framework leverages blockchain for an efficient solution, benefiting data-sharing individuals.

1.2 Contribution

The paper contributes a decentralized, secure, and scalable big data storage framework utilizing blockchain technology, enhancing data security and privacy. It introduces an adaptable finality consensus mechanism and techniques for secure connectivity, data permission management, and personalized data services.

1.3 Methodology

The methodology involves setting up a virtual blockchain on a distributed storage network, combining it with an adaptable finality consensus mechanism for decentralized storage, implementing a highway protocol-based consensus for big data blocks, and evaluating security, scalability, and mobility using baseline models. Performance evaluation confirms the framework's effectiveness, highlighting areas for future improvement.

1.4 Conclusion

The paper shows that blockchain-based big data storage framework with flexible finality is effective in addressing security, privacy, and scalability challenges. Emphasizing the importance of secure connectivity and data management, the proposed techniques provide a foundation for ongoing research in the evolving field of big data storage.

2 Limitations

2.1 First Limitation

One primary limitation of the proposed big data storage framework is its substantial computational and storage demands, potentially hindering scalability and performance in

certain scenarios. This drawback necessitates further exploration into optimization strategies to enhance the framework's efficiency.

2.2 Second Limitation

Another limitation is the dependency on a secure network infrastructure for decentralized storage and processing. Safeguarding against potential attacks and failures is crucial, emphasizing the need for robust network security alongside framework implementation.

3 Synthesis

The proposed blockchain-based big data storage framework harnesses blockchain benefits for decentralized, secure, and scalable solutions. While acknowledging challenges, it presents a promising avenue for organizations requiring robust data security and efficient management, potentially finding applications in sectors demanding secure and scalable data storage solutions.