A Review on Distributed Computational Network on a Peer to Peer Blockchain

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Abstract*: The survey outlines the implementation of a Decentralized Computational Network (DCN) using a peer-to-peer blockchain infrastructure. The focus is on overcoming centralization challenges such as scalability issues and security concerns. The study introduces dynamic load balancing, peertopeer consensus mechanisms, and smart contracts for decentralization and scalability. Additionally, it explores homomorphic encryption for enhanced privacy and a novel tokenomics-based incentive structure to encourage active participation in the DCN. This research contributes a concise yet comprehensive technical architecture for a resilient and efficient decentralized computational network*

Keywords: Transparency, Trustlessness, Dynamic Load Balancing, Incentive Mechanism, Peertopeer Consensus, Smart Contracts, Homomorphic Encryption

REFERENCES

[1]. Ihle, C., Trautwein, D., Schubotz, M., Meuschke, N., & Gipp, B. (2023). Incentive Mechanisms in Peer-to-Peer Networks — A Systematic Literature Review.

[2]. Naaz, R., & Kumar, A. (Year). Simulation of a Secure Approach of Data Communication on Peer-to-Peer Network Using Blockchain Technology on Ethereum.

[3]. Nazir, J., Iqbal, M. W., Alyas, T., Hamid, Dr, Saleem, M., Malik, S., & Tabassum, N. (2021). Load Balancing Framework for Cross-Region Tasks in Cloud Computing. Computers, Materials and Continua, 70, 1479–1490. https://doi.org/10.32604/cmc.2022.019344.

[4]. Shahzadi, K. (Year). Secure and Versatile Decentralized Ledger System Based on Blockchain for P2P Communication. International Journal of Computer Science and Telecommunications, 14(1), February 2023.

[5]. Carr, M. (2023). Blocktree: A Distributed Computing Environment. Retrieved from [Link](https://www.blocktree.systems/BlocktreeDce.pdf).

[6]. Ghosh, R., et al. (2023). DECENTRALIZED FILE STORING AND SHARING SYSTEM. Volume:05/Issue:05/May-2023, e-ISSN: 2582-5208.

[7]. Werth, J., Berenjestanaki, M. H., Barzegar, H. R., El Ioini, N., & Pahl, C. (2023). A Review of Blockchain Platforms Based on the Scalability, Security and Decentralization Trilemma. ICEIS (1), 146-155.

[8]. Kabla, A., Anbar, M., Manickam, S., Ahmed, A., & Karuppayah, S. (2023). Monitoring Peer-to-Peer Botnets: Requirements, Challenges, and Future Works. Computers, Materials and Continua, 75, 3375-3398. https://doi.org/10.32604/cmc.2023.036587.

[9]. Sie, M. F., Wu, J., Harding, S. A., Lin, C. L., Wang, S. T., & Liao, S. W. (2022). Secured Multi-Layer Blockchain Framework for IoT Aggregate Verification. ASTES Journal, 7(3), 106-115. ISSN: 2415-6698.

[10]. Lian, G. (2022). Blockchain-Based Secure and Trusted Distributed International Trade Big Data Management System. Mobile Information Systems, 2022.

[11]. Zhang, X., Grannis, J., Baggili, I., & Beebe, N. L. (2019). Frameup: An incriminatory attack on storj: A peer to peer blockchain enabled distributed storage system. Digital Investigation, 29, 28-42. https://doi.org/10.1016/j.diin.2019.02.003.

[12]. Wilkinson, S., Lowry, J. (2014). Metadisk: Blockchain-Based Decentralized File Storage Application. Retrieved from [Link](https://www.storj.io/metadisk.pdf).

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[13]. Wilkinson, S., Boshevski, T., Brandoff, J., Prestwich, J., Hall, G., Gerbes, P., ... (2016). A Peer-to-Peer Cloud Storage Network. Retrieved from [Link](https://www.storj.io/storjv2.pdf).

[14]. Vakilinia, I., Vakilinia, S., Badsha, S., Arslan, E., Sengupta, S. (2019). Pooling Approach for Task Allocation in the Blockchain Based Decentralized Storage Network. 2019 15th International Conference on Network and Service Management (CNSM), Halifax, NS, Canada. https://doi.org/10.23919/CNSM46954.2019.9012719.

[15]. Girgis, A. M., Ercetin, O., Nafie, M., & ElBatt, T. (2017). Decentralized coded caching in wireless networks: Trade-off between storage and latency. 2017 IEEE International Symposium on Information Theory (ISIT), Aachen, Germany. https://doi.org/10.1109/ISIT.2017.8006968.Salim DT, Singh MM, Keikhosrokiani P. A systematic literature review for APT detection and effective cyber situational awareness (ECSA) conceptual model. Heliyon. 2023 Jun 16.

[16]. Talib MA, Nasir Q, Nassif AB, Mokhamed T, Ahmed N, Mahfood B. APT beaconing detection: A systematic review. Computers & Security. 2022 Aug 21:102875.

[17]. Zou Q, Sun X, Liu P, Singhal A. An approach for detection of advanced persistent threat attacks. Computer. 2020 Dec 1;53(12):92-6.