IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.67
Volume 5, Issue 2, February 2025

# Blockchain as a Security Paradigm for Full-Stack Cloud Ecosystems

**Venkata Ashok Kumar Boyina[1] and Thiyagarajan Mani Chettier[2]**
Independent Researcher, Cumming, GA, United States[1]
Orcid ID: https://orcid.org/0009-0002-9171-297X
Independent Researcher, South Windsor, CT, United States[2]
Orcid ID: https://orcid.org/0009-0005-0568-6982

**Abstract:** *With the advent of cloud computing, organizations can now access scalable, on-demand computer resources, completely changing the technical landscape. Security issues like as data breaches, illegal access, and insider threats have emerged as a result of this broad usage. Blockchain technology has arisen as a strong security paradigm for full-stack cloud ecosystems since conventional security solutions cannot keep up with the increasing complexity of cloud environments. Blockchain, which is transparent, unchangeable, and decentralized, provides a potential answer to the security problems with cloud computing. In this article, we look at how full-stack cloud environments might benefit from blockchain technology by using it to increase user trust, data consistency, and security. First, it looks at how traditional cloud security measures, including centralized access control, fall short. These methods are susceptible to unauthorized changes and single points of failure. Applying blockchain to cloud ecosystems allows for analyzing its unique properties, such as distributed ledger technology (DLT), cryptographic security, and consensus processes. Cloud settings are made more secure with these characteristics, which guarantee storage that cannot be tampered with, better accountability, and robust access control mechanisms. Deploying blockchain in full-stack development, which includes both backend and frontend layers, is a major emphasis of this research. With blockchain technology, backend systems can protect private information, make microservices communication more secure, and use smart contracts to automate compliance enforcement. Users have more say over their data and less reliance on centralized identity providers when using frontend authentication techniques built on the blockchain. Developers may build safe, efficient, and scalable apps by incorporating blockchain into the two levels of full-stack cloud systems. Additionally, the article explores real-world applications of blockchain technology in cloud security, such as identity management, secure file storage, and data sharing. Take blockchain as an example. Its decentralized identity architecture allows for safe user identification, avoiding the problems of using passwords.*

**Keywords:** Blockchain Technology, Full stack Cloud Ecosystems, Cloud Security, Distributed Ledger Technology (DLT), Decentralized Architecture