

BLOCKCHAIN-BACKED MULTI-PROVIDER SLA ENFORCEMENT

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ABSTRACT

The rapid growth of cloud computing and distributed systems has led to the increasing complexity of Service Level Agreements (SLAs) between multiple service providers. Traditional approaches to enforcing SLAs in multi-provider environments are often hindered by trust, transparency, and automation issues. Blockchain technology, with its decentralized and immutable nature, offers a promising solution to enhance the enforcement of SLAs across multi-provider networks. This paper presents a blockchain-backed framework for multi-provider SLA enforcement, leveraging the core principles of blockchain to ensure secure, transparent, and automated SLA monitoring and execution. By utilizing smart contracts, this framework facilitates the automatic verification of SLA conditions, enabling real-time monitoring of service performance, and reducing the need for intermediaries. Additionally, the transparency and immutability of blockchain ensure that all parties involved have access to verifiable records, mitigating disputes and enhancing trust between service providers. The paper further explores the challenges associated with the implementation of blockchain in SLA enforcement, including scalability, interoperability, and the need for standardization. We propose solutions to address these challenges, such as the use of off-chain solutions for scalability and the development of standardized protocols for multi-provider integration. Through a case study, we demonstrate the potential of blockchain to streamline the enforcement of SLAs in real-world multi-provider environments, showcasing its ability to reduce administrative overhead, ensure compliance, and foster more reliable service delivery. This framework paves the way for more efficient and secure multi-provider collaborations in distributed cloud systems.

KEYWORDS: *Blockchain, Multi-Provider, SLA Enforcement, Smart Contracts, Service Level Agreements, Decentralized Systems, Transparency, Automation, Cloud Computing, Service Performance, Interoperability, Scalability, Standardization, Trust, Real-Time Monitoring, Distributed Systems*

Article History

Received: 09 Dec 2024 | Revised: 12 Dec 2024 | Accepted: 14 Dec 2024
