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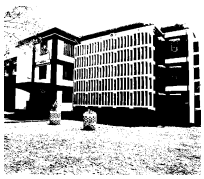

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# Blockchain-Assisted Secure Service Placement in Edge Networks

**Abstract:**

Edge computing enables low-latency service delivery by processing data near end users; however, edge nodes are highly vulnerable to unauthorized access, data tampering, and distributed denial-of-service (DDoS) attacks. Traditional centralized security frameworks introduce single points of failure, making them unsuitable for highly distributed and dynamic environments. This work proposes a blockchain-assisted trust management framework for secure service placement in edge networks. The system employs a permissioned blockchain to record and validate trust scores of edge nodes, ensuring transparent and tamper-proof reputation tracking. A lightweight consensus protocol, optimized for resource-constrained devices, facilitates secure and efficient agreement among nodes without the computational burden of conventional consensus methods. The framework integrates with Software-Defined Networking (SDN) controllers to dynamically orchestrate service placement and task offloading based on trust scores, latency requirements, and resource availability. By decentralizing trust and security decisions, the proposed model eliminates single points of failure, enhances resilience against malicious nodes, and preserves data confidentiality and integrity. The outcome is a patent-ready, decentralized security architecture that enables robust, scalable, and intelligent service orchestration in next-generation edge computing environments.

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Name and Signature of the Supervisor
Date: