Abstract

Ashraf F Tamam

Concurrency Conflicts Resolution for IoT Using Blockchain Technology

The Internet of Things (IoT) is a rapidly growing physical network that depends on objects, vehicles, sensors, and smart devices. IoT has recently become an important research topic as it autonomously acquires, integrates, communicates, and shares data directly across each other. The centralized architecture of IoT makes it complex to concurrently access control them and presents a new set of technological limitations when trying to manage them globally. This paper proposes a new decentralized access control architecture to manage IoT devices using blockchain, that proposes a solution to concurrency management problems and enhances resource locking to reduce the transaction conflict and avoids deadlock problems. In addition, the proposed algorithm improves performance using a fully distributed access control system for IoT based on blockchain technology. Finally, a performance comparison is provided between the proposed solution and the existing access management solutions in IoT. Deadlock detection is evaluated with the latency of requesting in order to examine various configurations of our solution for increasing scalability. The main goal of the proposed solution is concurrency problem avoidance in decentralized access control management for IoT devices.