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(57) Abstract :
QUANTUM-RESISTANT BLOCKCHAIN AUTHENTICATION FRAMEWORK FOR SECURE IOT DEVICE COMMUNICATION WITH DECENTRALIZED TRUST MANAGEMENT ABSTRACT The invention relates to a Quantum-Resistant Blockchain Authentication Framework 100 designed to enhance the security of IoT device communication. The framework includes a quantum-resistant blockchain network 102 that securely records and validates authentication transactions among IoT devices. An authentication module 104 integrated with the blockchain network performs cryptographic verification of device identities using advanced quantum-resistant algorithms. A decentralized trust management system 106, coupled with the authentication module, establishes and maintains trust relationships through a distributed ledger. The IoT device interface 108 ensures secure communication between devices and the blockchain network. The consensus mechanism 110 within the blockchain network achieves agreement on authentication transactions in a quantum-resistant manner, preventing unauthorized access and ensuring data integrity. This framework provides a robust, scalable, and secure solution for managing authentication and trust in IoT environments, resistant to future quantum computing threats.

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