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Data Encryption of Blood-chain data in Blockchain Network

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Abstract



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- I. Introduction
- II. Literature Review
- III. AES Algorithm
- IV. Implementation
- V. Results and Analysis

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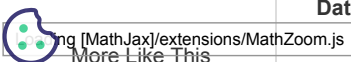
Abstract:

Blockchain technology is more advantageous in supply chain management since there is a constant need to record the transaction history of each node/party in the blockchain network. One such example is storage of blood donation and transfusion data on blockchain. As multiple parties such as blood donor, blood bank and hospital are involved, it is necessary to keep the part of their transactional data (such as donor's personal data, patient's personal data) as confidential. Hence in this paper, with the intension to provide more data confidentiality and security, the popular data encryption algorithm 'Advanced Encryption Standard (AES)', a symmetric key crypto-system is employed on part of blood-chain data before sending transactions to the ordering service and adding blocks to the ledger. Therefore, only a person who has access to the appropriate key that was used to create the cipher text can decrypt the encrypted data. In addition, the performance of the transaction using different parameters such as data encryption/decryption speed, storage is evaluated using Hyperledger Caliper Tool.

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I. Introduction

Blockchain are distributed implementations of cryptographically linked data blocks that are tamper-resistant [1]. It uses digital blocks that are copied, exchanged, and synced between users on a private or public distributed computer network who are dispersed across various locations or businesses. The availability of blockchain technology has increased across industries such as healthcare, pharmacy, payments, tourism etc [2]. Blockchain Technology is opted by many industries for the following features: •

Distributed: The data stored on blockchain is available to each node in the blockchain network.

•

Confidentiality [3]: It guarantees the security of data that is stored on blockchain against unwanted access. The data is only accessible to authorised users.

•

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Integrity [4]: Its responsibility is to make sure that the data received and distributed are completely same and unaltered.

•

Transparency: The transactions done by different parties and its data stored on blockchain are open to all.

•

Immutability: The data stored in blocks of the blockchain cannot be altered.

•

Consensus-based: Trust and security across multiple nodes on blockchain network is achieved through smart contracts.

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