Energy Optimization in Data Storage and securing the data using Blockchain Technology

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ABSTRACT

Now a days we are storing data's in a centralized database in a server machine. To store data in such a manner is very much costly because we need to maintain the server machine and high costly software also needed to manage the data. We require also some additional man power for database administration and server machine administration. The main disadvantage of this system is when this server machine crashes entire data will be lost. Another disadvantage of this system is to maintain some additional effort for securing of data. So this traditional approach of storing data in a database consumes lot of energy and money. In order to overcome this entire disadvantage we can use blockchain technology for storing data in an efficient and secure way without any human interaction, so that we can save lot of energy and money

Keyword - *Key word1 DBMS, blockchain, security*

1. Introduction

In a traditional way of storing data's in a DBMS is very much costly because of software cost and hardware cost. In addition to this we require some database administrator to manage data's in DBMS. Also DBMS requires a high end machine with high computing power is required to store and withdraw data. This system itself consumes lot of energy and power to store some data. It also have the main disadvantage of storing the whole data in a centralized server, there may be chances of crashing the server and losing the data permanently. In order to avoid all such difficulties we can make use of a new technology called blockchain technology. In this proposed system is a decentralized data storing technology with high level of data security. Since it is a decentralized system data is replicated in many nodes, so that if any node fails we can easily retrieve data from nearby nodes. The main advantage of this proposed system is, we can save energy and power drastically since it doesn't have any centralized database server.

How this system works?

The Blockchain technology uses technique of encryption and hashing. Main component of this technology is the use of blockchain. Blockchain is nothing but a chain of blocks linked each other and each block having many parts including data. This blockchain contains all the data is distributed to all the nodes in order to provide availability and non repudiation. The main components of blockchain are blocks, blockchain, different nodes etc.

1.Blockchain

Blockchain is a collection of block and each block having many parts including secret data, time, previous hash etc. The pictorial representation of blockchain is shown Fig1.
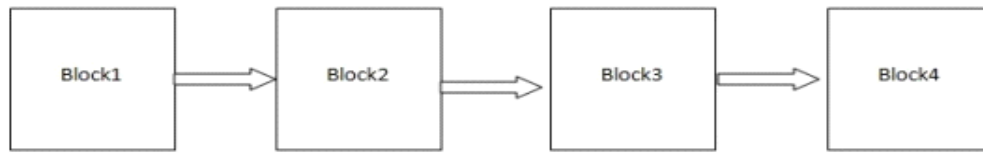
Fig1.

This chain is again stored in all other nodes .Each blockchain consist of multiple blocks are stored in each and every node participated in the network. So if any of the nodes fails data stored in the blockchain will not lost. The newly created block is added only after within a stipulated period of time. Within that time period, the nodes who want to store data can be appended to that node. After that this node is added to the blockchain and this blockchain is again updated with all existing nodes.

Blocks:

Another important part of this blockchain is blocks. In this block we are storing data within a stipulated period of time. In each block we are storing data along with some security measurements like hashed value and encrypted data. The data stored in the blocks are encrypted .And each block is storing the hashed value of previous block so that no one can alter the data in the block. If anyone alters the data the hash value remains changed and it is easily found because original hash value is also stored in the next block also. If any node want to store the data, then that node append his data on the newly created block.
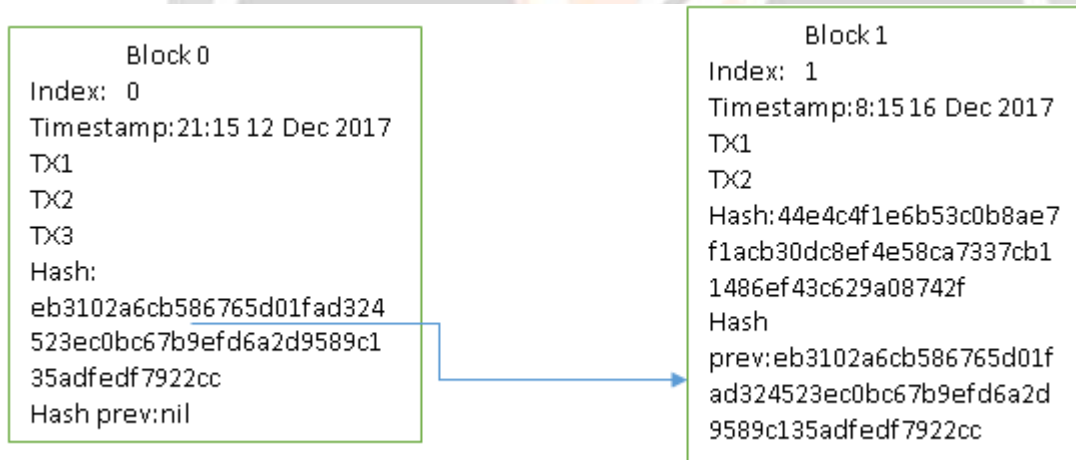
Security aspects:

The system that uses blockchain technology is more secure and reliable than the traditional database systems. Since blockchain that are created are distributed among all the nodes there won't be a problem of data losing. If any node tries to update any data, it can also easily detectable because all neighbors have original blockchain. The data stored in the blocks cannot be updated because it uses symmetric encryption and hashing methods to ensure confidentiality. Each blocks stored data in an encrypted format and hash this value and this hashed value stored in the next block in the blockchain. In other words no one can modify data in a blockchain and it is more secure than database systems.

Energy efficiency

The system with blockchain technology is more efficient and secure than the traditional systems. The traditional database system requires a centralized server machine to store data. This server requires high processing

power and needs uninterrupted power supply .This consume a lot of energy and power. It also requires a human administrator to manage all the data. So the traditional system is costly and energy consuming.

 The proposed blockchain system does not require any centralized server machine with high end configuration. Also it won't require any additional high cost third party software to managing and securing data. In the proposed system each node participating in blockchain is responsible for managing and securing data. If any one of the node fail causes no problem with the blockchain system. So this system is reliable secure and energy efficient.

Conclusion

Blockchain technology can be implemented in all the areas which need high security. The secure data can be stored in different blocks in the blockchain, which is distributed among all the nodes. Storing data in the blockchain is more secure and reliable. Since it is not based on centralized system, database server is not at all needed to store data and we can optimize energy and money.

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