

Blockchain: An Inside Review

Ayyub Ali¹, Dr.Mohammad Mazhar Afzal²

Department of Computer Science and Engineering, Glocal University, Saharanpur

ABSTRACT

Blockchain is a database which can be directly shared between non-trusting parties, without a mediator. Blockchains are more secure than regular databases in some ways, and less secure in others. In this article we will discuss the differences between blockchain and traditional database.

Keywords: Blockchain, Decentralized, Traditional Database

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I. INTRODUCTION

Blockchain is a database which can be directly shared between non-trusting parties, without a mediator. Blockchains are more secure than regular databases in some ways, and less secure in others. In this article we will discuss the differences between blockchain and traditional database.

1. Blockchain

Blockchain is a new way of storing data. In blockchain data is stored in a “distributed” ledger of transactions. A blockchain is a chain of blocks of that grows as new data is added to the chain. Each “Block” contains a hashed key which links it to the previous block, a timestamp for when it was altered, and transaction data. A blockchain is inherently immutable - once recorded, data on the blockchain cannot be changed. In a blockchain to update an old record, the majority of the nodes must be agreed to change. Blockchain technology is one of the rising technologies now days. Due to its great features its being frequently discussed in the world of technology. It may bring us more reliable and convenient Services. Blockchain is a bunch of technologies containing mathematical algorithm, Cryptography, peer-to-peer networks, distributed database. Its main features are:

1.1 Anonymity

In a blockchain all trustless nodes are connected with each other i.e. trust is not required to make transaction between the participating nodes. Any node who wants to make a transaction with other node just needs the address no need to know personally. Thus the transactions are anonymous in a blockchain.

1.2 Self-sufficiency

In a blockchain no one is the boss. Every node has the same rights. Any node can make confirmation of any transaction no one has the right of intervene to other node. Each node has the same copy of the history of transaction in any chain.

1.3 Decentralized

The main feature of blockchain is its nature of free from control of any central authority. No central controlling unit is required in a blockchain system. The data is stored distributedly, i.e. each node has the same access to the data. The absence of anyone from the network will not affect the complete system because all are having the same data with them. So this property of a blockchain saves from the burden and trust of a single central administrator.

1.4 Inconvertible

Any transaction will be recorded in immutable form. Once a transaction is verified and stored can't be changed. Thus a blockchain is a write only technology. No update is allowed in it. This property makes the system immutable.

1.4 Transparency

Transparency is also a feature of a blockchain system. Nothing is hidden in the system. All transactions are transparent. All trustless parties are able to see the data of each unknown node in the system

II. TRADITIONAL DATABASE

A traditional database is based on client-server mechanisms. Each user can play with the central database on the basis of permissions associated with their accounts. In a centralized

system administrator is the key person who grant the permission for accessing the database.

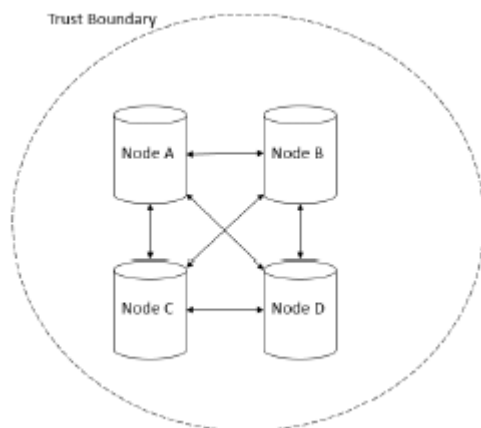


Fig 1. Traditional Distributed Database and its trust area

III. DIFFERENCES

But it's completely different in a blockchain system. In the blockchain all participating nodes are responsible for every transaction. Every transaction before adding in a block is verified by each node providing in-built security for the network.

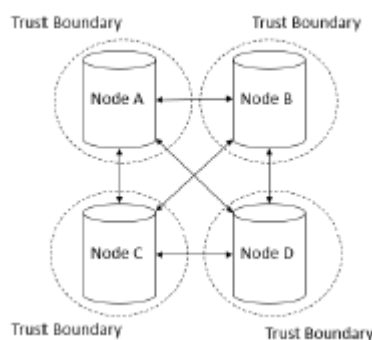


Fig 2. Blockchain And trust

On the basis of way of function of blockchains are good as a system of record for certain functions, while a centralized database is appropriate for other functions.

3.1 No Central controlling body

In blockchains there is no one who has to control the system as a central authority. All trustless parties shares their data without the interfere of a central governing body. The core property of decentralized system is that it eliminates the risks of centralized control.

But in a centralized system a person having sufficient access to the system can play with the information stored in that system. Also the end users are dependent on administrator for giving access. In a centralized system trust is the key of any system.

While blockchain deals with the trustless parties. The nature of free from control of a central authority is the main building block of a blockchain. There is no central unit who control the blockchain transactions. In the blockchain transactions are verified and processed without a central authority.

Why as system without a mediator is powerful? Because any database is just not a bit or byte but it's a group of important things. If the contents of a database are stored in the memory of central system run by a third party even if it is a trusted organization, anyone who somehow got access to that system can easily corrupt the data within.

Although in the central system to make it sure that the system is fully secured and safe the third-party organizations especially those who control important databases need to spent a lot design many processes to prevent that database being tampered with. But in blockchains, to avoid the third party mediators distributed database is used. And the security is handled by cryptography.

3.2 Up to date

In blockchain database the information stored is relevant now. It also has a record of old transactions. Once stored information in blockchain can't be changed or update. The transactions are first verified and then stored in the form of blocks. New block is attached with previous block and so on that makes the chain of blocks.

3.3 Performance

Blockchains are considered slow as databases in comparison with traditional database. The nature of blockchain requires that speed be sacrificed. Actually, the performance of a blockchain depends on different factors such as:

- Network latency
- Size of the P2P network
- Size of the transaction

3.4 Confidentiality

In a public blockchain every node has the equal rights to read or write a block. Every node in a blockchain independently verifies and processes every transaction. The information written by any user is available for all nodes. For many applications the full transparency is an absolute deal-killer. In a traditional database data can be read, write or update. But in blockchain we can only write the data. In case of a regular database If confidentiality is required blockchain has no advantage on centralized database.

3.5 No middle man

The main property of a blockchain is to share the data between the trustless participating nodes without requiring a middle man. This is possible because it has its own way of validation and authorization of transactions. Transactions are verified and processed by a number of nodes. Every node has the same rights to validate the transactions. No one can alter the information because every node has the same copy of the data. But in case of a traditional database data is stored in the memory and disk of a computer; anybody with sufficient access to that system can play with data and corrupt. Any organization dealing with important data has to pay more security. But blockchain provides the security of data by using cryptography and without the need of a middle man.

3.6 Immutability

A blockchain is a chain of blocks; each block contains the information of a number of transactions. A blockchain is inherently immutable - once recorded, data on the blockchain cannot be changed. To modify any existing record in the blockchain, the majority of participant nodes in the network would need to agree on the change. By allowing digital information to be distributed, but not altered without consensus, blockchain technology creates the potential for a new system of trust to be leveraged as the backbone of the internet.

3.7 Easy handling

In blockchain all the transactions are stored in a single ledger that is public in nature. It's easy and convenient handling a single ledger instead to handle the multiple ledgers. It's also a great job keep the similarity in multiple ledgers when we have a large amount of data, and a large numbers of

users. The property of having a single ledger makes it user friendly.

3.8 Empowered to the individual

As in the central system the control is in the hand of controlling unit. The blockchain is free of control of any particular authority. Individuals are in control of all their information and transaction. Thus in the blockchain system has the equal power. Every node is the boss itself. It's self-controlling system. No one can interfere to you.

IV. CONCLUSION

Decentralized governance removes the chance of risks of centralized administration. In a centralized system anybody with sufficient permissions can modify the data. Therefore users are dependent on the security model of the administrator. In blockchain the data is stored in decentralized storage to avoid this type of issues.

Though traditional databases are better suited for some type of data, blockchain technology is well-suited to store certain kinds of transactions. The selection of any technology depends on the choice of any organization to understand what it wants from a database.

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