Analysis and Introduction of the Future Application of Block Chain

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Content

Introduction

Blockchain is described as "pioneering technologies" in many articles. It is usually discussed with other computer network technologies such as fog computing, cloud computing, edge computing and Internet of Things. People think they could be mixed in the future [Fig. 1]. In this paper, the characteristics of blockchain technology will be analyzed in detail, and the possibility of future application of blockchain will be proposed. It is worth mentioning that the blockchain e discuss in this paper all refer to public chains.

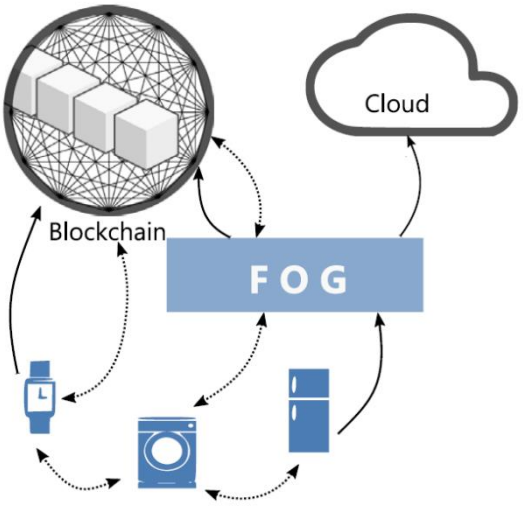

Figure 1

Characteristic Analysis of Blockchain

Decentralization: Blockchain is a distributed book, and the fight for the right to keep accounts and the action of keeping accounts is often called "mining" in the specific example of Bitcoin. In the blockchain network, there are many nodes. Theoretically all of you can be one of them if you want. These nodes contend for the right to create a new zone every ten minutes, that is, the right to keep accounts.

Blockchain is mainly composed of block header and block body. The block body includes transaction counter and transactions recorded by this block. Simply put, the block header contains the difficulty of the puzzle and the puzzle needs to be solved in the mining. If you decipher the problem first, you can create a new block and get the reward through the coinbase transaction. In fact, this mining mechanism is POW (proof of work) mechanism, which makes it possible for each node to become a bookkeeper at a certain cost. This is the reason why the block chain has the characteristics of decentralization.

Of course, PoW may not be an inevitable attribute of the blockchain, and now other consensus mechanisms are also beginning to get some discussion. For example, Proof of Stack, but the author believes that PoW may form a mixed consensus mechanism with other mechanisms in the short term, but it cannot be replaced.

Decentralization has many advantages. First, if a node fails, it will not lead to a global collapse. Second, decentralization is a fatal temptation for some anarchists.

Simplicity: In the Bitcoin White Paper, Nakamoto said that Bitcoin is a P2P e-cash system, and obviously blockchain which used in the Bitcoin also have this feature. This makes transactions easy and simple. For complex transaction processes, P2P transaction is very easy to understand and operate.

Stability: Blockchain on the main chain are not modifiable. Because blockchain is linked by hash pointers, hash pointers can tell us where the data is stored and the hash value of the data. Each block in the blockchain contains a hash pointer for the previous block, which can find all blocks and verify whether the data is correct. The hash function used in hash pointer is an encryption algorithm, specifically SHA-256 function, which has strong tamper resistance and make blockchain immutable. As long as any block is modified, the block data will become different. By comparing with the main

chain, we can know if the block has been modified. This feature gives the block chain a series of valuable points, such as anti-counterfeiting, traceability, data stability, and cannot be modified.

Permissible Branch: One of the characteristics of block chain is that it allows errors. The way he corrects errors is not to correct it traditionally. It can be imagined that if there is a mistake in a book in the traditional banking system, it will be very troublesome to correct it. In block chain, we just need to move on and find the chain that develops faster. Because only if one person has 51% of the total global network computing power, it is possible for him to forge a downward all the way and extending the wrong chain. Because if a person can have such ability, he must be a key figure in the field of bitcoin, he will not want to make bitcoin untrustworthy. At the same time, the rewards he received through normal means are already very impressive, and he does not have to break his own money. In short, under normal circumstances, this situation is unlikely to happen.

Large data volume: If there is only a small number of users, the number of nodes should be less, which is almost equivalent to centralization. Decentralization can only be achieved by distributing power to more nodes. At the same time, if the amount of data is small, it is likely to gather in a same block, so there is no need for new areas to emerge soon. Public blockchain is not suitable for small areas and small organizations. Moreover, the efficiency of blockchain is faster than that of long-distance and large-scale data exchange. If blockchain is used in a short range, the weaknesses of blockchain will be reflected, such as high latency, slow speed and occupying storage resources. Although the current private chain optimizes these shortcomings, this paper believes that they only need to be optimized within the original centralized system to achieve similar effects. It is not necessary to use the blockchain.

Conjecture on the future application of blockchain - music copyright protection

Music copyright protection currently faces several problems. First of all, the music copyright is more confusing, the purchase method is not transparent enough, and the interests of copyright holders are not guaranteed. Because of the large number of service providers, users do not know who authorized their music, and do not know how much money they spend on music purchases to the music producer itself. This has made some users who are willing to buy music hesitate and the consumer experience is bad. Not just ordinary users, many music producers, video producers, or TV stations are plagued by copyright issues. They don't know the specific content of the copyrights they buy from certain channels, or whether they can use these songs in their own products. Secondly, the amount of data on music copyright is too large. It is very wasteful to store data that is not frequently used through traditional data structures. It is also difficult to query. Again, if the music copyright record is modified by hackers, it cannot be traced, which makes it very difficult for musicians to defend their rights.

Traditional music copyright protection uses DMR (Digital Rights Management) technology, which does not effectively prevent piracy and poses a threat to users' personal information. The new blockchain technology may be solved copyright issues better in many aspects. Blockchain is transparent, users can clearly know where they are buying copyright and licensing specific content. Blockchain and big data are very close, it allows data to be cut into many small pieces, each time the use does not need to call all the data, at most just call their hash value. The blockchain is very stable and secure, and all data cannot be maliciously modified. At this point, the blockchain seems to solve most of the proposed Problem. Undoubtedly the addition of blockchain will optimize the current music market. Users have a better user experience; music producers' income become transparent. But there are still some problems to be solved. Because the blockchain can protect transaction records, cannot protect music files, if the music files are cracked, there seems to be no way for the blockchain. If there is no way to really stop piracy, then the district Chain does not give the music industry has brought a revolutionary change. I believe that the real name system will block the introduction of a private chain may be the most likely mode.

This private blockchain operates by authorizing nodes and users. In this way, the qualification of the node can be authenticated, and the identity of the user can be

authenticated by real name. The node is responsible for recording information about the copyright transaction and withdrawing remuneration from each transaction. The rights to use the song, the right to sell, etc. are distributed by the music author to each user. The user conducts a peer-to-peer transaction in the blockchain network, and packages the contents of the block header of the blockchain storing the transaction into the audio file to complete the transaction. If a piracy outflow is found, the hash value stored in the file can be used to find the transaction that occurred and cancel the buyer's authorization.

It may not completely solve the long-standing copyright problem in the music industry, but at least it will make the environment better and make more people willing to pay for the music they listen to, because they can now have a bit of a better relationship with music producers.

Conclusion

This paper lists five characteristics of blockchain and explains their causes. This paper introduces the dilemma of weak copyright protection in music industry and puts forward a block chain application in music industry. This paper argues that this application can partly solve the current dilemma of the music industry, but there is still a long way to go to completely solve the copyright problem. Blockchain is so looking for areas where they can really play their role.

Reference resources

Satoshi Nakamoto. (2008). *Bitcoin: A Peer-to-Peer Electronic Cash System*. Available: https://bitcoin.org/bitcoin.pdf. Last accessed 13th May 2019.

Hany F. Atlam, Gary B. Wills. (2018). *Technical aspects of blockchain and IoT*. Advances in Computers. Available: https://doi.org/10.1016/bs.adcom.2018.10.006. Last accessed: 30th May 2019.

Ana Reyna, Cristian Martin, Jaime Chen, Enrique Soler, Manuel Diaz. (2018). *On blockchain and its integration with IoT. Challenges and opportunities*. Published by Elsevier B.V. Available: https://doi.org/10.1016/j.future.2018.05.046. Last accessed: 30th May 2019.

Coin desk. (2018). *How do Bitcoin Transactions Work?* Available: https://www.coindesk.com/information/how-do-bitcoin-transactions-work. Last accessed 13th May 2019.

BINANCE. (2019). *Blockchain Use Cases*. Available: https://www.binance.vision/blockchain/blockchain-use-cases . Last accessed 13th May 2019.

BINANCE. (2019). *Proof of Stake Explained.* Available: https://www.binance.vision/blockchain/proof-of-stake-explained. Last accessed 13th May 2019.

Stephanie Sanderson. (2018). Is blockchain the future? Available: https://www.fintechnews.org/is-blockchain-the-future. Last accessed 13th May 2019.

NATHAN REIFF. (2018). Forget Bitcoin: Blockchain is the Future. Available: https://www.investopedia.com/tech/forget-bitcoin-blockchain-future. Last accessed 13th May 2019.