

Cloud Computing Big Data Application Research Based on Blockchain Technology

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Abstract. In the application process of cloud computing technology based on blockchain technology, due to the high similarity between cloud computing technology and blockchain technology at the network architecture level and technology application mode level, the two technologies can be reasonably integrated to allow customers to cut relevant data and distribute such fragmented data to the whole blockchain system for storage [1]. In view of the complexity of "blockchain" technology and the humanistic thinking it brings, it is a subversive revolution for the existing society, whether at the level of technology or the level of people to people values. Combining it with cloud computing big data can highlight the role of both.

Keywords: Blockchain, Cloud Computing, Big Data

1. Theoretical support for big data application of cloud computing based on blockchain Technology

1.1. Network architecture

It can be seen that the current two technologies have great similarity in application types, among which the corresponding application mode can play a basically similar function. From the perspective of network architecture, both technologies have built a distributed network in the application, and there are no various nodes in the traditional network system. The network of blockchain is based on IP communication protocol and distributed network technology, and has no central server node and central management node.

1.2. Data structure and operational efficiency

Cloud computing technology can compete the computing power and ensure that the data input personnel make efforts in data writing. Blockchain, also known as distributed ledger technology, is based on the distributed network and does not need to be audited by other central institutions. It cuts up each data file, encrypts it with the user's own key and distributes it in the network. At the same time, the concept of "work proof" introduced by blockchain technology ensures that the recorder has made some efforts in writing data through the competition of computing power. Cloud computing uses virtualization technology to realize the virtualization of storage, computing and network, which



matches the distributed storage and computing requirements of blockchain [2].

1.3. Smart contract level

Traditional contracts are executed under the legal framework, while smart contracts are an "assembly language" on the blockchain, and computers can automatically execute protocols. Automatic contract can be applied as an account with automatic guarantee. In the application of blockchain technology, the computer will automatically execute relevant protocols, while cloud computing technology will integrate all kinds of scattered information to achieve low-cost on-demand distribution. As shown in Figure 1.

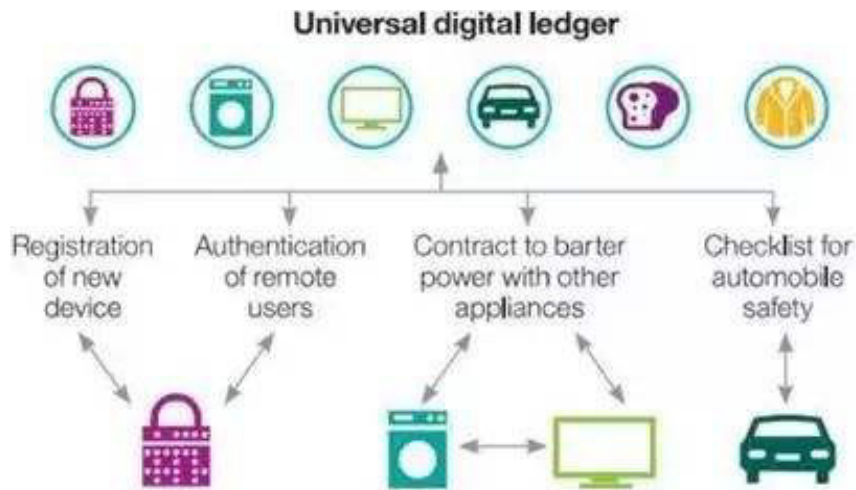


Figure 1. Theoretical process of the combination of blockchain and big data.

2. Cloud computing big data application mode of blockchain Technology

2.1. Data center architecture

In the process of data center architecture, there are two aspects. On the one hand, it is the various hardware and software devices of the user end, including the PC terminal, which usually stores some scattered data. On the other hand, the cloud computing system platform provided for operators will store a large number of segmented data in the application. In the application of localized cloud computing technology, the two systems will be put into operation as a unified whole, which requires the construction of communication system in the system, so that the staff can quickly access to all kinds of data, and the cloud computing technology can integrate these fragmented data. The data center is based on the cloud computing center of the operator to build an isolated network environment, and divide the independent private domain (private cloud) for important customers. This is the simultaneous interpreting of proprietary domain and traditional data center by using simultaneous interpreting / VPN connection. The domain of private domain is like the extension of traditional computer room. The cloud resources are like the hardware resources of traditional computer rooms, and can be configured and dispatched independently according to their own needs. For example, select the own address range, divide the network segment, configure the routing table and gateway, so as to realize the smooth migration of the application to the cloud [3].

2.2. Cloud computing center architecture

The cloud computing center mentioned in this paper provides cloud computing service system for operators. Compared with traditional cloud computing technology, localized cloud computing technology will disperse fragmented data into the whole blockchain. This technology puts forward higher requirements for the cloud computing center to ensure that the cloud computing center can effectively integrate various fragmented data. In the construction of the system, the form of private

domain can be applied to ensure the integrity domain technology, the cloud computing center should be able to schedule resources independently, such as selecting its own IP address range, configuring routers and gateways, and dividing network segments. Finally, relevant data can be migrated to ensure that these data can be effectively stored in the cloud computing center [4]. As shown in figure 2. Customer data center and Feitian cloud computing center are connected through optical fiber or VPN special line. The resources allocated by Feitian cloud computing center to customers are equivalent to a part of the client's computer room. Without changing the customer's data center, Feitian cloud computing center can have elastic access, stable and secure cloud computing center. As shown in Figure 2. Adding cloud computing information in the blockchain helps to carry out a large number of data calculation and data integration through computer assistance, and helps the staff in related fields to complete the work more efficiently. As shown in Table 1.

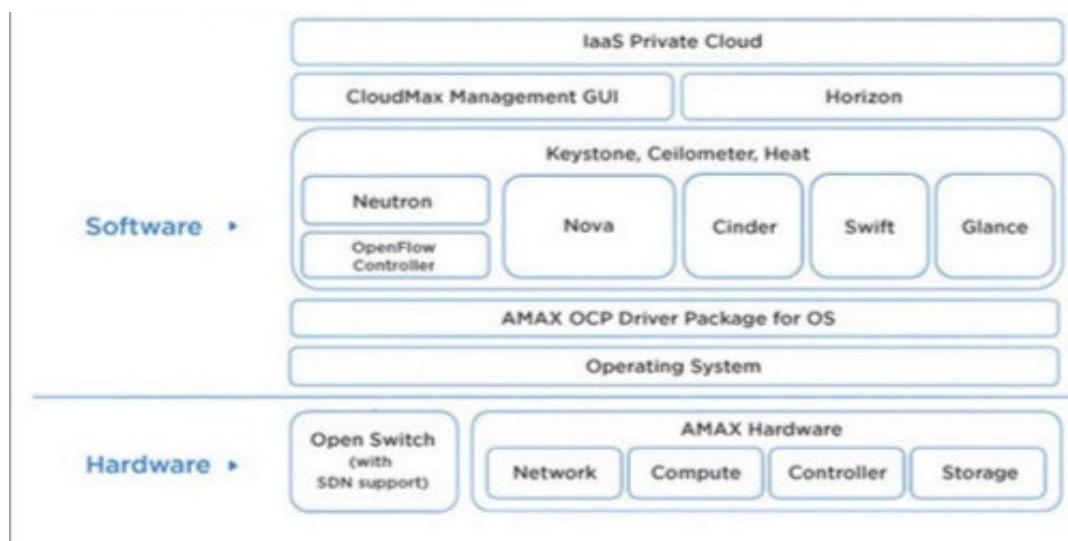


Figure 2. Cloud computing architecture.

Table 1. Adding cloud computing information to blockchain.

Project	2019	2018	2017
Operating income	14870331	10029739	6748083
Operating profit	9671673	5352559	3979758
Credit impairment loss	5519570	2594480	2242175
Total profit	4133224	2768110	1741412
Net profit	3949752	2474133	1448157
Net cash flow from operating activities	36354559	46260688	3679567

3. Cloud computing big data technology composition of blockchain technology

3.1. "Decentralization" technology

In the final analysis, people's praise of decentralization comes from their dissatisfaction with the

centralized structure that exists in all kinds of networks. But here we have to ask, why do we generally choose a centralized structure? Centralized structure must be because there are some outstanding advantages rather than disadvantages, so it is widely used. "Decentralization" technology uses distributed accounting and storage. There is no centralized hardware or management organization, and the rights and obligations of any node are equal. The data blocks in the "decentralized" system are jointly maintained by the nodes with maintenance function in the whole system, which makes everyone become the information provider and solves the problem of diversity of information collection. With the large-scale use of this technology, the dependence of users is greatly reduced, which objectively forces the relevant personnel to change the working mode and focus of work. In the application of cloud computing technology, there will be two aspects, one is data storage system, the other is cloud computing center system. These two systems need to run together, and both of them can achieve "decentralization" [5]. Technology can only play a role if it really solves the problem. We should not deny that decentralization does have its own advantages, but we should also be aware of the inherent limitations of this technology, such as low efficiency in function and organization. In the practice of decentralized blockchain application, new forms of centralization have emerged, which is a mature and pragmatic performance. Some people think that the Internet starts from decentralization and matures from re-centralization. This conclusion is like a prediction of the future development of blockchain technology. Centralization and decentralization are a pair of objects that are often compared together. The two provinces do have a controversial relationship, but they are by no means rivals. In some application areas, the performance of centralization may be better than that of decentralization, while in other application areas, the performance of decentralization may be better than that of centralization. A single flower is not spring, a hundred flowers bloom, spring is full. In reality, there are thousands of applications. Only the technology that can solve problems and promote the two aspects to gain is a really good technology. Blockchain technology is just a baby who has just learned to walk on the ground. Whether it can make a big show in a wider world still needs to be proved. In order to achieve long-term development and really occupy a place in the long history, regional decision chain technology must complement other technologies to form a joint force and solve real problems. The purpose of developing a technology is not to create antagonism, to replace whom, but to solve problems. Moreover, it is a good thing to say that it is a good thing, and the encouragement technique is done, and it is the performance of the ping-pong.

3.2. *Unchangeable distributed ledger technology*

The technology of unchangeable distributed ledger proves that once the information is verified and added to the blockchain, it will be stored permanently. Therefore, the data stability and reliability of blockchain are extremely high. It brings a brand-new credit mode with its characteristics of "no tampering and no repudiation", which solves the problem of information storage security. The secure and confidential transaction of data not only breaks the phenomenon of data isolated island which has long troubled the whole industry, but also promotes many new business models and opportunities. Taking the credit reference industry as an example, data transaction promotes the data circulation in the credit industry, and the integration of multi-source data can provide strong support for credit agencies to comprehensively evaluate the credit level of individuals or enterprises.

3.3. *"Open and consensus" technology*

The "open and consensus" technology solves the problem of maximizing information dissemination. Anyone can query the "blockchain" data and develop related applications through the open interface, so the information of the whole system is highly transparent. As shown in Figure 3.

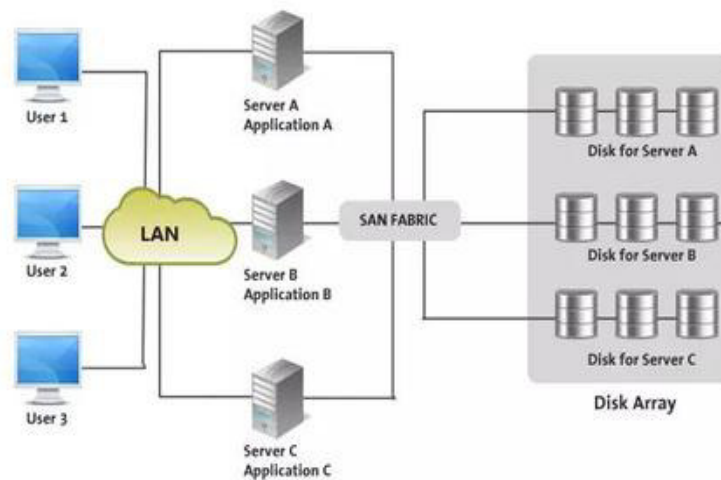


Figure 3. Technical composition.

4. Conclusion

For all units and enterprises, improving service quality is an eternal theme, and information service is the most important service mode, and the carrier of information service is big data [6]. The purpose of big data analysis is to provide users with better personalized and diversified services. The premise of all this is to rely on the universality of data sources, the security of data storage and the accuracy of data dissemination. Therefore, it is necessary to combine blockchain and cloud computing big data for common development.

Acknowledgement

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