Analysis of Big Data Information Security Problems and Countermeasures from Cloud Computing

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Abstract: With the continuous development of society, China has officially entered the era of data. As the most important and especially important big data in modern times, it has penetrated into various regions of China. With the explosive growth of various data information, the issue of big data information security has gradually emerged. Based on this, this paper expounds the problems of big data security from the perspective of cloud computing. Moreover, from the current situation of China's big data security, the paper analyzes the current situation of cloud computing analysis of big data security issues.

1. Research Background

1.1 Literature review

With the continuous development of the economy and society, research on cloud computing has become a topic that must be paid attention to in every field. Many enterprises and related industry insiders gradually regard cloud computing as the core of computer technology architecture in Internet technology (Han, 2013). The cloud computing service provides a large number of network data centers for people, that is, can store a lot of data information and application software, and can also maintain the maintenance work of information data and application management, while providing efficient and convenient query for customers, It can also eliminate many safety hazards of customers (Yang and Guo, 2018). However, with the deepening of Internet technology in all walks of life in China, the number of occurrences of cloud computing in each enterprise during the process of information construction is constantly increasing. Cloud computing should involve a lot of information, and it must be done with better security protection so that its own interests can be better protected without damage (Guo et al, 2018).

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1.2 Research purposes

With the continuous development of the economy and society and the drive of the era of big data, big data has spread all over China's streets and all the big data has become one of the important factors for China's move to the world, but the security of big data in China. There are many problems in this regard. Based on this, this thesis studies the current big data, and uses the actual and theoretical as the entry point to study how to analyze the big data security from cloud

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computing in China, and puts forward how to calculate from the cloud. An improved strategy for analyzing big data security issues in the field of vision, in order to provide reference and reference for how to analyze big data security issues from cloud computing.

2. Conceptual Definition

2.1 Cloud computing

Cloud computing is a new definition, and there are many different understandings of this definition. Foster's definition of cloud computing is this: cloud computing is a large scale distribution computing mode, and this mode is Economies of scale drive, so that the cloud computing model can provide many resources such as platform and computing and storage in a manageable manner and in an Abstract.and dynamically evolving form on the network according to the needs of external customers.

As can be seen from the above definition of cloud computing, cloud computing belongs to a different distributed computing model. Compared with traditional computing models, cloud computing has the following very significant features:

Cloud computing has high reliability. For cloud computing growth and development rely on high cloud services, cloud computing must provide security measures for cloud services to ensure high-frequency reliability of cloud services, so high reliability is one of the necessary features of cloud computing.

Cloud computing has a large scale. Cloud computing is a large-scale computing model. Cloud computing reflects the advantages of each cloud computing service, such as service advantages, by using a larger computing model.

Cloud computing is highly dynamic. Cloud services can be dynamically configured in a virtualized form to achieve dynamic expansion and be delivered to customers according to customer needs, thus meeting the different needs of each customer.

Cloud computing is low cost. Cloud computing is a type of computing model driven by economies of scale, enabling it to take advantage of economies of scale to achieve the benefits of low cost services.

Cloud computing is virtualized. Cloud computing can take advantage of the form of virtualization to form an Abstraction of each level of functionality to achieve a cloud service that can be provided to every level of external customers. Customers can use every terminal in any location and other terminals to do so without having to know the specific location and implementation of the service provider.

2.2 Big data

Big data is inherently a relatively Abstract.concept, and today there is no one that is recognized by people. “Big Data” is defined by wikis as the use of software that people often use to capture and manage and process data that is wasted more time than people can tolerate (Wen, 2015). “Big Data” is also defined by Gartner as a new processing model that can have big data with strong process and decision making power and insight into the large and diverse discovery power and high growth rate of information assets. At the same time, many scholars have visualized that “big data” may belong to new oil in the future (Li, 2017). And all definitions of big data are basically based on the characteristics of big data. The 4V definition is more representative for big data. I think big data should have four characteristics: big data is valuable, scale and high speed, and diversity. And such data has a large scale, rising from terabytes to PBs; at the same time, data has many different types, including unstructured and structured and semi-structured many different data types; it contains very high value. And has a very high ability for data processing.

3. Big Data Information Security Issues

With the continuous development and the era of big data, data resources have become one of the important assets of today's society. Many decision-making behaviors will be based on big data.

Nowadays, as the era of data analysis and information services, the security of information faces the new challenges brought by big data.

3.1 The risk of privacy being stolen

With the continuous development of society, the current information services such as mobile networks and Weibo and social networks, these new forms are different from the past, and many data in the Internet are constantly being produced. People's personal data is highly likely to be searched and stolen at will, which will pose a great threat to privacy. On the one hand, a large amount of data resources are concentrated in the Internet, such as information resources and user information and each behavior of the user, even if not stolen, the risk of data leakage is greatly increased. On the other hand, compared with some private data and more important data and sensitive data analysis, it does not clearly define the use rights, which is closely related to the disclosure of privacy.

3.2 Data is difficult to store

Nowadays, the use of data extends to mobile networks and WeChat and Weibo. Therefore, a large amount of data is generated in this activity. Such a large data set has great test for the storage space and hardware and software devices. How to prevent the illegal theft and damage of these data and the loss of data is a major challenge for big data storage. In addition, in the cloud computing environment, big data will reduce the cost. People tend to store data in the cloud, and the open nature of the cloud leads to many potential threats caused by a large number of customers coexisting.

3.3 Easy to be hacked

Big data relies on the Internet for information delivery to serve customers. The most obvious target on the Internet is obviously big data. For big data, it contains a lot of sensitive data and user behavior, and a large number of information resources will attract many attackers. In addition, big data can be used by hackers to use botnets to attack, and a large number of machines can be controlled at the same time, which is not possible with traditional single-point attacks. At the same time, hackers can use big data to launch APT attacks. However, this APT attack code will be hidden in big data and difficult to detect.

4. Big Data Information Security Countermeasures Under Cloud Computing Analysis

4.1 Strengthen the control of big data information security technology

With the continuous development of the economy and society, the online data of people on the Internet is constantly increasing, which leads to the hacker's desire to attack the network is more intense, and the hacker's attack means and tools are more specialized and complicated than before. Therefore, cloud computing has more requirements for information security than big data. In terms of technology, network security uses technologies such as network security auditing and vulnerability scanning, access monitoring, and intrusion detection. Means, the single prevention method is that there is no way to effectively guarantee the security of the cloud storage network.

Network security audit. Compared with the intrusion detection system, the network security audit has no relative real-time requirements, so it can analyze all the historical data such as system activity and running logs and database operation records of a large number of servers, and can also be used. Big data to achieve complex and more sophisticated analysis, in order to display more types of hacking, and its false positive rate will be lower than traditional intrusion detection.

Access control. The customers linked by the cloud storage must use the client's privilege division and identity authentication before using a large amount of data resources. Only after the authorization is owned can the application system and data resources within the scope of the authority be accessed, and the relevant data obtained. Analytical results and other relevant information. Using a single point and unified authentication method, in conjunction with PMI's permission control technology, to increase the research on authentication and encryption technology,

it is effective for each customer, each level of data acquisition and access management data and access data. Analysis results.

4.2 Strengthen the detection of big data information security technology

Vulnerability scanning. Vulnerability scanning includes various problems such as firewalls and routers, as well as every application system and application server OS such as switches, as well as staff, all virus infections and security patches, and system vulnerabilities. Vulnerability scanning systems should be timely cyberattacks, ARPs, and system vulnerabilities, and provide effective tools for prevention, repair, and interception so that risk assessments can be made for the entire network system so that corresponding measures can be taken in a timely manner. . Compared with the previous vulnerability scanning, at present, a large amount of time is wasted for a large amount of data scanning. Therefore, it is necessary to improve how the speed and accuracy of the Internet data scanning can be effectively improved. Intrusion detection. With the accelerated development of cloud storage information resources and data resource sharing, the construction of cloud storage has accelerated in an industry. The scope of application of the Internet has also been attacked by many hackers as it expands day and night. This will lead to an increase in network security issues, so prevention in the detection of malicious intrusions must be taken seriously. Big data is a double-edged sword in terms of information security. It should use the huge analysis technology of big data to effectively analyze the source information to determine whether the network is abnormal.

4.3 Effectively protect the cloud storage of data

With the continuous development of the society, the current cloud storage computing efficiency and flexibility as well as scalability, can effectively solve the problems of management and big data storage, but cloud storage has a platform open complex and a large amount of data scale There are also issues such as high concentration of management, which will pose a great threat to information security. Therefore, ensuring the security of cloud storage is fundamental to the era of big data. The most worrying thing for customers is whether all the data they store in the cloud is completely secure and has no illegal access. Therefore, the three technical means of data disaster recovery and identity authentication and encrypted storage are studied and used to ensure cloud security.

4.4 Building a big data information security regulatory system

If massive data information leaks, it will bring huge losses to businesses and individuals. Big data information security is not only a technical issue but also a regulatory issue. Therefore, based on cloud computing, big data information should not only maintain information security from the technical aspects of network security, cloud security, etc., but also need to protect data security supervision at the level of early sensitive data auditing, data privacy protection, resource sharing mechanism and data security supervision. Maintain the security of big data information from a management perspective to prevent information leakage. Specifically, the awareness of information security management of big data information managers should be improved. At the same time, it is necessary to delineate the scope of database management of each department and strengthen the internal management of each data department. Moreover, the big data information management department should formulate operational specifications for the use of data information of terminal equipment, and establish scientific and effective methods and means for monitoring big data information. In addition, for some private data, sensitive data and other important data information, the use of systems and management specifications are formulated to further regulate the use of big data information processes and methods.

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