Research on the Implementation Method of Database Security in Management Information System Based on Big Data Analysis

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Abstract: With the rapid development of China's society and economy, and the support of modern information technology, we have entered the era of big data. The amount of data in management information systems continues to increase. Big data has become an inevitable trend in the development of modern information technology. At the same time, the security of the database in the management information system has received increasing attention. This article studies the implementation method of database security in management information system based on big data analysis, hoping to provide reference for relevant people's research.

1 INTRODUCTION

With the development and popularization of modern information technology, and the support of Internet of Things technology, cloud computing technology and big data technology, we have now entered the era of big data, and people live in massive amounts of data every day. In order to help enterprises and individuals to more conveniently query the information data they need, management information systems and database systems are widely used, and big data analysis technology plays a very important role in data security in information management systems.

2 Overview of Big Data Analysis

Big data analysis is generally called "Big Data Analysis" and is the core of big data technology. It is defined as "a collection of tools and technologies that can efficiently store and process massive amounts of data, and effectively achieve multiple analysis goals." In common words, big data analysis refers to the collection, storage, analysis and visualization of all kinds of big data. It is a set of tools that can solve the 4V problems of big data such as massive, high-speed, changeable and low density, and provide high-value information through analysis.

From the perspective of technical support architecture, the essence of big data analysis is a software technology framework, and its main functions include the following aspects:

First, Volume, that is, big data analysis can handle extremely large data sets.

Second, Velocity, that is, big data analysis can provide extremely fast data insertion operations.

Third, Variety, that is, big data analysis can operate on many different data types.

Fourth, Volume & Velocity, that is, big data analysis can use distributed parallel processing mechanisms.

In addition, big data analysis can also support real-time data analysis and historical data analysis, and provide users with a variety of different data analysis methods or models.

According to the above analysis, the most basic feature of big data analysis is that it has a distributed development technology framework, which can realize Map/Reduce computing, and at the same time, it can perform unified scheduling and flexible deployment of distributed computing nodes to achieve Distributed collection, storage, analysis and calculation of massive data.

Another technical support for big data analysis is the storage technology of massive data. In the face of massive amounts of data, traditional relational databases are no longer able to meet the needs and need to be improved or reformed. The software technology framework of the big data analysis system will inevitably use some kind of distributed database technology or NoSQL (non-relational database) technology. Therefore, from the perspective of developers, the underlying technical support for big data analysis mainly includes three aspects: first, distributed computing frameworks, such as Hadoop, or other computing frameworks with Map/Reduce mechanisms; secondly, distributed storage mechanisms, such as distributed databases, HDFS or NoSQL; finally, streaming computing frameworks, such as CEP or ESP.

3 The Necessity of Using Big Data Analysis to Realize Database Security in the Management Information System

At present, in the field of network and information security, we are facing a variety of challenges: On the one hand, with development, the structure of the security system of enterprises and organizations has become increasingly complex, involving various security data, and traditional analysis methods. It has been unable to meet the needs of development; on the other hand, new types of cyber threats are emerging, especially in the era of big data. While enjoying the convenience brought by big data, people are also facing information security challenges brought by big data. At present, the network has entered the Gigabit era to the 10 Gigabit era, and the amount of data packets that network security devices need to analyze has also risen sharply. At the same time, the security gateway must perform detailed analysis on the application layer protocol, which also leads to the need to analyze a large amount of data. In addition, with the in-depth development of network security defense, the content of security monitoring is continuously refined. In addition to traditional attack monitoring, compliance monitoring, application monitoring, user behavior monitoring, performance testing, and transaction monitoring are also required. Wait, the increase in these contents also means that more data needs to be monitored and analyzed. Based on this, we increasingly need to conduct faster analysis and judgment on network information security. Therefore, the industry recognizes that big data analysis technology is gradually applied to information security, that is, to conduct big data security analysis. According to actual applications, big data security analysis technology in the field of network security mainly includes: security incident management and security management platform, APT detection, 0day malicious code analysis, network forensic analysis, network abnormal traffic detection, large-scale user behavior analysis, security intelligence analysis , Reputation services and code security analysis.

But for big data security analysis, the most critical thing is not the big data itself, but the method used to

analyze the data. Because when applying big data analysis to the security field, you must also consider the characteristics of the security data itself, and then adopt appropriate analysis methods to achieve the predetermined security analysis goals, so as to realize the value of big data security analysis.

4 Research on Database Security Realization Method in Management Information System Based on Big Data Analysis

If you want to use big data analysis technology to realize the security of the database in the management information system, you must first establish a security management platform, that is, a security operation center called SOC (Security Operations Center). In this platform, with assets as the core, security incident management as the key process, and the idea of dividing security domains, a set of real-time asset risk models are established to assist the administrators of the enterprise management information system to analyze incidents and carry out incidents at the same time. Risk analysis, early warning management and emergency response processing. Because the core of the security management platform is security information and event management, it performs unified real-time monitoring of all IT resources in the enterprise or organization, including security information generated by networks, systems and applications, including various logs, alarms, etc., and correspondingly Historical analysis, especially external intrusions, internal violations or misoperations, must be monitored in real time, and investigation and evidence collection and audit analysis must be conducted, and then various reports and reports will be issued to achieve the goal of compliance management of IT resources , While improving the security operations, threat management and emergency response capabilities of enterprises and organizations. The structure diagram is shown in Figure 1:

Figure 1. The structure Diagram of the Security Information and Event Management System of the Security Management Platform

As shown in Figure 1, the security implementation of the database in the management information system based on big data security analysis technology can collect logs at a high speed and analyze events at a high speed. It also supports the collection of multiple log types and log sources, and supports The collection of semi-structured and unstructured information, as well as the correlation analysis between heterogeneous data; at the same time, the database in the management information system based on big data security analysis technology can not only analyze massive amounts of data, but also determine which data is truly useful. Value data refers to the data that analysts pay attention to. It is data that can be used to assist decision-making. At the same time, it can visualize the results of security analysis and present it to security administrators, and store them in categories for people 'S access. Only by meeting these requirements can the security management of the database in the management information system be realized.

5 CONCLUSIONS

To sum up, in the current era of big data, database security in management information systems is a very important topic. It involves a wide range and many security strategies can be adopted. Based on big data analysis technology to achieve management information system The security of the database should be carried out with the help of the 5V feature of big data analysis technology, build a distributed development technology framework, and realize the calculation of Map/Reduce, and at the same time carry out unified scheduling and flexible deployment of distributed computing nodes, so as to realize the Distributed collection, storage, and analysis and calculation of massive data are the only way to achieve database security in the management information system based on big data analysis.

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