Design of computer network security storage system based on cloud computing technology

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Abstract. Nowadays, computer networks are widely used. Besides the convenience, people also feel the pressure of network viruses and hackers. At present, in the process of fighting against network security threats, traditional defense measures have been difficult to meet. Therefore, in order to meet the needs of computer network security under cloud computing technology, and for the future of cloud computing high-quality network storage system can be gradually optimized. In this paper, from the cloud computing and network security storage system two aspects of the computer network security storage performance analysis and design; Then from the design framework, through careful design, to ensure the reliability and security of data upload, storage.

1. Introduction
With the advent of the era of big data, we have gradually stepped into an era of information explosion, in which all walks of life are flooded with a large amount of data information. In order to make the user's work and study can be more convenient, we not only need to deal with a large amount of data information, but also need to realize data resource sharing.

In addition, we also need to keep user data and information safe online. In modern society, hacker invasion, Trojan attack and other words are familiar, which not only represents the arrival of the information age, but also represents the importance of network security. Therefore, this paper proposes a network security storage system for cloud computing environment, so as to ensure the security of mass data and the security of user system use.

2. Cloud computing technology
Cloud computing is a type of distributed computing, in which huge data processing programs are broken down into countless small programs through the network "cloud." The results are then processed and analyzed by a system of multiple servers and sent back to users. Compared to traditional computer networks, cloud computing can perform 10 trillion calculations per second. Therefore, cloud computing technology has been fully applied in weather forecast, market dynamic trend prediction, explosion simulation test, users only need to connect the terminal device of data information and data center control, can carry out the corresponding data information calculation according to the actual demand to a certain extent.

Cloud computing is divided into three types: (1) Infrastructure as a Service (IaaS). Users can obtain more computer Infrastructure services through the Internet, such as renting hardware servers. (2)
Platform-as-a-Service (PaaS) refers to the provision of the software development Platform as a Service to users in the SaaS model. For example, users can develop corresponding system application software based on their own basic requirements. (3) software-as-a-Service (SaaS), cloud computing developers rely on the basic skills of the Internet to provide Software Service mode for users, users do not need to buy the system application Software, but simply use the form of lease to obtain the right to use.

3. Network secure storage system

In the traditional basic data information storage architecture, the main device for data information storage is the server, which can obtain the corresponding data according to the actual demand to a certain extent, thus occupying a certain amount of network bandwidth, making the CPU network resources have load. In order to ensure the sharing of data information between adjacent programs, it is necessary to paste the corresponding information resources to other devices. However, this will cause data transmission delay and increase the overall transmission time. Therefore, it is imperative to establish a data and information security storage system with strong continuity and scalability.

With the continuous development of science and technology in today's world, in the background of cloud computing technology can be combined with network technology and secure storage technology, so as to establish a computer network security storage system based on cloud computing technology, the system can separate data information from the server, effectively store a large amount of data information. However, the overall architecture of the system is relatively complicated, and it is not a simple traditional disk device, but a combination of server system and data information storage system in the application case to speed up the transmission rate of data information while maintaining the original transmission accuracy.

4. Design of computer network security storage system based on cloud computing technology

At present, with the continuous improvement of the development level of network technology in China, the application scope of cloud computing in various fields has been continuously expanded, which also makes people eager to design a network security storage system. In this system, B/S structure is needed as the overall framework to ensure that it can fully meet the various application requirements of the network. During the design and development of the network security storage system, users' data storage requirements should not only be effectively met, but more importantly, information data storage security should be ensured. And data in by the client and the Web server for transmission in the process, but also the need to carry out the encrypted transmission of data processing, and through the HTTPS protocol to showcase the encrypted information, to ensure that the data information reliability and security in the transmission process, and then to the development of network storage system and the design is also becoming more applied value.

4.1. Overall structure design

The overall structure design of the computer network security storage system based on cloud computing technology is roughly in the sequence of start, user opening browser, user login interface, user registration, system operation, and end. The overall structure is shown in Figure 1.
4.2. Data storage System structure

Traditional storage technology is not suitable for massive data storage, low efficiency, can not meet the digital requirements of The Times. The cloud storage system consists of various network devices and servers. Each device takes the storage device as the core of its operation and accesses and stores data through application software.

The structure of the data storage system is shown in Figure 2. The client needs to upload and download data through the user interface of the cloud. As a storage module, the data pool needs to save all data without providing computing functions. Designing a reasonable network security data storage system can effectively ensure the data security in the data pool. The node cluster is mainly used for cloud computing. The control center manages the node cluster, which can be adjusted at any time in the actual computing process, process the data information from the client, and save the operation results after processing in the data pool.

Figure 1. Designing of the whole machine.
4.3. **System function design**

The cloud storage technology system is complex and involves many contents. All servers are indispensable and are the core of storage devices. In real work, relevant data can be stored by application software and accessed on this basis. Based on cloud computing, in the design of login module, HTTPS protocol should be used to ensure the relevant communication. In addition, in the user registration information link, information preservation to ensure that information is not leaked, improve the security of data. In the secure storage system architecture optimization, the server receives information and decrypts it. Data certificate module is also important to authenticate file numbers. In specific applications, during user operations, files need to be encrypted and stored first, and then transmitted on this basis to increase the security factor from the source.

**Figure 2.** System structure drawing.

**Figure 3.** Computer network security storage system structure and function diagram.
5. **Application of cloud computing technology in network secure storage system**

The distributed storage technology of cloud computing can give full play to the role of cloud computing in the network secure storage system. Through text, pictures, audio, video and other forms, files can be effectively expanded, creating a secure and stable storage environment, and saving users' investment in service fees as much as possible. In order to improve the security of cloud storage data, THE METHOD of MC-R is usually adopted, namely, the user MC-R policy and the cloud MC-R policy, to achieve effective data control.

Among them, in the encryption calculation of user MC-R, cloud computing technology is mainly applicable to network security storage. For the threat factors in the network environment, users can be analyzed through the use of programs, especially for hackers and viruses in the network, which are likely to lead to information leakage. In this regard, the MC encryption computing method can encrypt the cloud and database, build data camouflage module, data marking module, etc. Under the interaction of each module, the data security can be improved more significantly. In the cloud MC-R application, a set of RSA keys is first established based on user requirements. After saving, MC encryption algorithm is used to process the data, and the data is uploaded to the cloud. After encrypting the data, users download files through the cloud and unlock the files through the key.

6. **Conclusion**

To sum up, due to the popularization of computer application, computer network security has received more attention and attention, research and development of computer network security storage system to meet the development needs of The Times. This study starts with cloud computing technology, and on the basis of understanding computer network security, puts forward the system design of computer network secure storage under cloud computing technology, and the application of cloud computing technology in network security storage system, which provides certain reference for similar research and helps the healthy development of the computer industry.

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