Countermeasures of Computer Security Storage and Cloud Computing Technology

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Abstract. With the development and application of the Internet, it has greatly changed the way people live, produce and learn, and has been widely used in all fields of society. In the process of computer operation, massive data information is generated, which provides important technical support for computer storage for the effective processing of these data information. The Internet is a double-edged sword, which provides convenience, and is threatened by computer virus, illegal access, hardware damage and so on at the same time in the process of computer information storage, which leads to the collapse of computer system to bring huge economic losses for enterprises and individuals. This paper first expounds the security problems of computer security storage and the characteristics of cloud computing technology, and combines the characteristics of cloud computing technology to explain the application of cloud computing technology in computer security storage.

1. Introduction
Cloud computing is another innovation of Internet technology, which has the characteristics of expansibility, compatibility, reliability, distribution and so on. It integrates computer resources effectively and provides users with high quality and reliable information resources. Cloud technology is the key direction of the development of information industry and the key content of large enterprises and Internet research. The data information of enterprises and organizations can be stored in the cloud. The enterprises and institutions can search and download the data according to their own needs, which provides convenience for the use of data through cloud computing technology. However, cloud computing technology is based on the Internet, cloud data is easy to be invaded by network hackers, virus Trojan attacks in the storage process, which results that cloud resources are falsely used, causes huge economic losses for users. In recent years, Internet enterprise system data information leakage frequently, computer information storage security has been widely concerned by the society. The application of cloud computing technology in computer storage system needs to strengthen the optimization of computer information storage security technology to ensure the security of computer information storage.

2. Computer Security Storage and Cloud Computing Technology

2.1. Problems of Computer Security Storage
Computer security storage means that the resources and information resources of computer information system are not threatened and endangered by natural and human factors. With the development of computer information technology, computer storage security is facing more and more threats. Computer storage security is mainly faced with computer virus, illegal access, hardware damage and so on.
Computer virus is a Mini Programs hidden in computer software. Once the computer is turned on, the Mini Programs starts automatically and destroys the data and data file of computer software.[1] Even some computer viruses attack computer programs, steal data information from computer systems or tamper with data information, which threatens the security of computer information. Therefore, it needs to be strengthened to prevent invasion of computer viruses. Illegal access is that network hackers steal identity or forge legal identity into other people's computer systems, extract, copy, modify computer system data. Therefore, it is necessary to add the identification of the legitimate users of the computer, encrypt the data or set the operation log by the computer, and can read and write and modify the automatic record of the important data mechanically. Computer storage hardware damage refers to the failure of computer storage equipment, which can not be recognized or lost normally, which is a common fault of computer hardware equipment.[2] Therefore, computer users should backup or copy the data regularly, once the computer fails, they can copy the data. In the environment of high security performance, two hosts can be used, one host fails and the other is running normally.

2.2. Cloud Computing Technology
Cloud computing technology calculates and processes massive data information through network cloud and decomposes it into countless Mini Programs, processes and analyzes these Mini Programs through server system, and finally feedback the processing results to users. Cloud computing technology integrates computing resources and uses software to realize automatic management, which provides convenience for users. Users can pay a small amount of fees to use network resources according to their own needs. Compared with traditional network application technology, cloud computing technology has the following advantages: first, virtualization. Cloud computing technology uses servers to store data information in computer space, which breaks the space limit and completes the backup, migration, storage and extension of data to terminal devices through virtual platforms.[3] Second, dynamic extensibility. Cloud computing technology has high speed computing power, and can realize the dynamic expansion of virtualization resources to meet the needs of computer storage. Users can choose the corresponding computer capabilities and resources according to the requirements and computing capabilities of their own operating environment. Third, flexibility. At present, the hardware and software devices in the market support virtualization servers, such as computer operating system, network hard disk, cloud disk and so on. The virtualization of cloud computing is to put all elements in the cloud virtual pool for unified management, which can be compatible with different brands of hardware devices. Fourth, high reliability. Because cloud computing technology puts data information in the cloud, once the server fails, because cloud computing adopts distributed computing mode, a single server failure will not affect the overall operation of the computer and ensure the stability of the computer operation. Fifth, scalability. In order to meet the demand of mass data growth in big data era, enterprises have higher requirements for cloud computing storage capacity space. Through cloud computing technology, users can expand the corresponding business according to the software system.

3. Application of Cloud Computing Technology in Computer Secure Storage
3.1. Authentication Technology
Identity authentication technology is an effective method to confirm the identity legitimacy of the operator in the operation of the computer system. In the course of operation, the computer system needs to identify the identity of the user and set different access rights according to the identity difference to ensure computer system data security. Identity authentication technology is the first firewall for computer information security protection. Identity authentication technology commonly used static password, short message password, dynamic password, digital signature and biometric.[4] The static password is set by the user himself, and the correct password should be used when logging into the network system. The correct password system automatically thinks that the operator is a legal user with opening the system to the visitor. Short message password is to send random dynamic digital password to the user's mobile phone in the form of short message. When the user logs in, he needs to enter the
dynamic password to ensure the identity security of the login user. Dynamic password is a terminal device that users need to use to generate dynamic password automatically. The dynamic password of terminal device is changed once a minute. At present, bank, electronic government and electronic commerce widely use this authentication method. Digital signature is also called electronic encryption. The user sends to the computer system a digital symbol that can not be forged by others. Through encryption technology, the password is converted into a certain length of message, and the system recognizes the digital symbol in order to judge the identity of the user. Biology identification technology is based on the physiological characteristics and behaviors that can be measured or automatically recognized and verified, and compared with the stored user biometric information by reading the information, and can be verified if the information is consistent.[5] In order to ensure the security of computer data information, the computer system can adopt the above two or three authentication methods, that is, two-factor authentication, to ensure the security of computer information system.

3.2. Backup and Recovery Technology
Backup and recovery technology is a technology that can backup and restore data in real time through computer backup system. The general computer operating system has its own backup program, but with the continuous improvement of computer operation requirements, the original backup program can not meet the increasing requirements of computer data processing, so it is necessary to adopt special backup technology. Data storage technology includes hardware technology and software technology, hardware technology generally adopts tape machine technology, tape machine with high capacity, manageability, relatively low price; software technology is to transfer computer system files to another server through computer CPU and network protocol. Software backup and recovery technology supports synchronous and asynchronous.[6]

3.3. Encryption Technique
Encryption technology is to transform important data into random code by technical means. After transmission to the destination, a certain method is used to restore the random code. At present, encryption technology is widely used in electronic commerce and VPN systems. The algorithm combines ordinary text information with digital symbol to produce incomprehensible ciphertext. After the key transmits the text information to the destination, the algorithm decodes the information. The security of information transmission can be ensured through key encryption technology. Encryption technology can be divided into symmetric encryption and asymmetric encryption. Symmetric encryption is that file encryption and file decryption use the same key, that is, the encrypted key can also be used to decrypt. This key is relatively simple, the algorithm is public, the computation is small, the encryption speed is fast, and the decryption is difficult. However, both sides use the same key, the security of information can not be guaranteed. Each time a pair of users uses a symmetric algorithm, they need to use a key that others do not know, which increases the number of keys owned by both parties and increases the difficulty of key management to some extent; asymmetric encryption has two keys. Public key and private key. If you choose a public key to encrypt, you need to use a private key to decrypt, and if you choose a private key to encrypt, you need to use a public key to decrypt. Encryption and decryption must use different keys. Asymmetric encryption method can be good confidentiality, but encryption and decryption process is long, the system runs slowly, which is not suitable for file encryption and is suitable for a small amount of data encryption processing. The following is the flow of asymmetric key information transmission.
Figure 1 Unsymmetrical Key Transmission Process

According to the above process, it can be seen that the sender encrypts the transmission file with encryption algorithm and converts it into ciphertext and sends it. After receiving the file, the receiver needs to decrypt the file with a public key or a private key before obtaining the plaintext format of the file. This encryption method allows file sender and file receiver to have different ciphertext to ensure the security of file transfer.[7]

3.4. Perfect Computer Network Security Storage System
With the development of cloud computing technology, cloud computing can not only provide distributed computing methods, but also provide parallel computing, network storage, utility computing and other computer hybrid technologies. The application of cloud computing technology in computer network secure storage system can meet the requirements of user information storage. The distributed system architecture can also ensure the security of information storage. When the computer network security storage system is designed, it should not only meet the requirements of user information storage, provide users with login, registration, information query and other functions, but also connect the computer network storage system to the server through the network protocol. Through encryption technology, backup recovery technology, firewall technology, setting up a security protection wall for the storage system, users manage the plaintext through encryption and then metal transmission when they transfer information. After the system accepts the file, it needs to decrypt and then store the data so as to prevent data from being stolen, embezzled, and ensure the security of information. Cloud computing storage space has big capacity, strong compatibility, and can keep pictures, text, symbols, video, audio and other different forms of data.

4. Conclusion
The security of computer information is related to the security of personal and enterprise information. With the popularization and application of computer technology, the security of computer information storage is paid more and more attention. Cloud computing technology is a computer network storage system, making full use of cloud computing compatibility and the expansibility to meet the needs of the development of computer network storage system.

References
[1] Bao Jinfeng. Application of Cloud Computing Technology in Secure Storage of Computer[J]. Network Information and Computers ,2019,031(024):191-193.
[2] Bai Shucheng. Application of Cloud Computing Technology in Computer Secure Storage [J].Research Information Records ,2020,21(1):207-208.
[3] Li Fei. Analysis on the Application of Cloud Computing Technology in Computer Secure Storage [J].Computer Programming Skills and Maintenance ,2020,(8):106-107.
[4] Liu Wenjing. Analysis on the Application of Cloud Computing Technology in Computer Secure Storage [J]. Digital Design (I), 2020, 9(7): 19-19.

[5] Jiang Wei. Application of Cloud Computing Technology in Computer Secure Storage [J]. Information and Computers, 2019, 31(23): 210-211.

[6] Miao Yu Rong. Application of Cloud Computing Technology in Computer security storage [J]. Heilongjiang Science, 11(16): 102-103.

[7] Wei Chengxin. Application of Cloud Computing Technology in Computer Security Storage [J]. Information and Computers, 2019, (11): 212-214.