

# Optimization Strategy of Computer Network Security Technology in Big Data Environment

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**Abstract:** With the rapid development of computer technology and big data technology, the security of computer network has become a key problem that restricts its development. The improved new technology also causes huge network security problems. The continuous development of big data will improve the design level of computer network security system. However, as a media, the computer's requirements for computer network security will also increase. Therefore, it is necessary to continuously strengthen the security of computer network system, improve users' usage and improve the network security status. It is a very effective means to improve the network security through legal restrictions, so it has become the first task. With the continuous improvement of information and data transmission speed, information and data will accumulate in the process of information technology utilization, thus causing security problems. The computer network security technology in the big data environment seriously affects the development of information technology and the development of the whole society.

**Keywords:** Big data environment, Computer network, Safety technology, Optimization strategy.

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## 1. Introduction

With the rapid development of information technology and computer technology, big data comes into life gradually, bringing convenience to everyone's life; At the same time, because of its unique nature, it can also have a specific impact on the security of computer networks. With the rapid development of big data exchange technology, it is very necessary to strengthen the security of computer network. In recent years, with the rapid development and wide application of information technology, our country has provided important opportunities for the development of all aspects of life. At the same time, it also has a significant impact on social production and people's lives. The application and development of big data are closely linked with computers. In the big data environment, people pay more and more attention to the security of computer networks because of the large amount of information generated. Further strengthening computer security and ensuring the security of computer network using information technology has become an important theme of society at this stage, which needs to be dealt with urgently and properly.

## 2. The Status Quo of Computer Network Security Technology Development Under the Background of Big Data

Big data is quite common in life, and it is closely connected with the Internet of Things and cloud computing. Therefore, whether the computer security system can protect the security of personal information becomes very important nowadays, and there are still many problems in the computer network security in the big data environment. For example, the security of data transmission cannot be guaranteed, and it may be interfered by viruses, Trojan viruses and other factors, resulting in data being stolen or modified during transmission; It may also cause loss and destruction of information due to

system security problems caused by backward systems and too many loopholes in firewalls; Other problems fully show that the development of computer network security technology is not perfect enough, and it is necessary to further improve it [1]. By analyzing the situation of computer network security development in today's big data environment, we can fully understand it and better study the optimization strategy of network security technology under this background [2].

## 3. Analyze the Application of Network Security Technology in Detail

### 3.1. Analyze the application of intelligent firewall technology in detail

In the process of construction, firewall is a remote defense system outside the boundaries of internal and external networks, generally speaking, it is an integral component of software and hardware. Firewall plays a very important role in the defense of network security, and the data packets of internal and external networks also need to be fully identified by firewall[3]. By observing the security rules, the internal network can prevent unauthorized users from accessing the system illegally, and effectively intercept harmful data packets caused by the internal network and computers. Therefore, the security in the network can be significantly improved. In the process of building an intelligent firewall, the firewall can not only play the traditional defense function, but also solve the problem that people attack servers everywhere. Hierarchical data processing can greatly reduce the computational complexity of big data and further increase the possibility of discovering and dealing with network security problems. The efficiency of intelligent firewall is further improved in the process of network defense.

### 3.2. Analyze the application of intrusion detection technology in detail

Intrusion detection technology is an active security defense technology in the process of building a firewall. In the process of construction, it is an effective and sufficient supplement to

firewall technology; The embedded agent detection system collects key host information from backbone network and corresponding network for comprehensive analysis, processing and verification[4]. It can be judged whether hackers can be identified in the process of network construction. During the creation process, substantive precautions are taken, so that defects can be found and mechanical responses can be made before attacking the network system, so that confirmation reports can be created and timely feedback can be given to network managers.

## **4. Analyze the Design of Network Security System in Detail**

### **4.1. Conduct a comprehensive inquiry into the safety protection system**

In the process of construction, network security protection must be comprehensively dealt with. It is necessary to comprehensively and effectively cover all levels of the network system. Therefore, it is necessary to deeply study the use of network system and data collection. And network security system should be fully demonstrated in the process of construction. In the process of building, the method of protecting network security is highly mobile, and it needs a lot of technical support, including security management before and after the activity, so that it can run under the whole network security system [5].

### **4.2. Detailed analysis of safety early warning module**

Analysis of behavioral weaknesses and aggressive behaviors is the main function of the security early warning system. In the process of building the computer network in the big data environment, there are many freely purchased application software, which make full use of different structures and development environments and different languages, and provide mutual cooperative communication. For example, based on the abnormal situation of the network, a wide range of algorithms can analyze and give an effective warning to their own behavior. Predicting all types of network attacks can greatly improve the network early warning function and strengthen the security of the network system.

### **4.3. Comprehensive analysis of safety protection module**

At present, in the process of computer network security construction, many protection functions include the full use of virtual network, firewall and anti-virus software. Protection measures are well integrated and simplified, which can effectively improve the integrity of usage data[6]. There are many innovative technologies in the network security defense system of the big data center, such as the network security defense system, which can also comprehensively apply many innovative technologies such as digital envelopes and digital signatures, so as to avoid many negative behaviors such as information tampering, information camouflage and information denial during the construction of data communication. In this way, the combination and link of several technologies can effectively reduce the possibility of virus infection and network information attack in the construction process[7].

### **4.4. Analyze the safety detection module in detail**

In the process of the development of computer network, through many technologies such as intrusion files and network route analysis, we can continue to realize more timely monitoring and network traffic operation. Through the related technologies of hardware and software, it can continue to calculate data deeply and report the underlying thinking results, so that the network security response can be better maintained.

### **4.5. Analyze the system recovery module in detail**

Due to the current social development, the number of computer users in China ranks first in the world. In the actual operation of network technology, the vast majority of users can't receive formal network security training, that is to say, it is easy to have network security accidents caused by numerous wrong treatments[8]. Therefore, the network will be threatened by many dysfunction in the whole network engineering process. In the process of security threats, the recovery system module can continue to resume normal operation, which helps to prevent the loss of customer information.

## **5. Specific Problems Existing in The Development of Computer Network Security Technology Under the Big Data Environment**

Big data is a part of the further expansion and development of network technology. In the application process, it is interrelated with the Internet of Things and cloud computing. At that time, big data spread to production and life. With the development of network information technology, security problems always exist. With the rise of the era of big data, the influence of computer security issues is increasing. Today, the main challenges are data transmission network, computer hardware and system security. It is very important to analyze the security of the surrounding computer network and find the main security problems[9].

### **5.1. Problems in the system and firewall**

The security of operating system plays a key role in the security of database, and firewall is the first line of defense for network security. The crazy invasion of viruses and Trojans causes many loopholes in the computer system, which not only interferes with the normal operation of the computer, but also causes the loss, outflow and destruction of user information. In addition, due to the insufficient attention and application of firewall technology, network security problems have arisen. Firewall can fully identify internal and external data and effectively improve network security[10].

### **5.2. Problems at the hardware level**

The function of hardware is to store, process and analyze a large amount of data generated by big data. It has a great influence on the security of the hardware computer network. Because of the particularity of the hardware, the security factor is very high. The main reason for the problems in the hardware construction is that the external environment (such as high temperature and electromagnetic environment) changes and damages the hardware. In the process of using

hardware, if the hardware data transmission is abnormal, it may cause the loss of data, and this kind of data loss can not be repaired, which has a great impact. Therefore, great attention should be paid to the security of hardware.

### **5.3. Network data security issues**

Network security is also one of the problems to be solved in computer security. Computer data is easily interfered by some uncertain factors such as viruses, hackers, and Trojans, and these factors are easily stolen or destroyed during transmission[11]. Data loss has a serious impact on normal production and life; In addition, most users haven't paid enough attention to data backup, which makes it difficult to recover data after it is lost. At the same time, the weakness of the system or software forces the virus to enter the user's equipment and steal key information such as personal accounts, which seriously threatens the security of personal property and privacy.

### **5.4. Security issues in data transmission**

The use of "big data" technology to generate a large amount of information, and there is a relatively large computer network risk, while the storage and transmission of information data. Because of the openness of the network, the existence of network viruses and Trojans has a great threat to the spread of network information and data. Especially in the big data environment, the application of information has penetrated into human production and life. If information is lost or maliciously manipulated in the process of information transmission, it will have a great impact on our production and life. Through the continuous development and wide application of information technology, on the one hand, the development of information technology can be realized; On the other hand, it also improves virus software and Trojan horse technology. At the same time, it also greatly increases the destructive power of viruses, and affects human survival and production activities. By developing and using virus software, we can prevent illegal stealing and manipulation of network information and data to gain some economic benefits and cause losses to others[12].

### **5.5. System security issues**

The main functions of the network system in the application process are as follows: effective connection. Therefore, when the system security is affected, the actual application of information technology will have a specific impact on computer security. In the environment of big data center, the network environment is very complex, so the operating system also has high security standards in the use of network information technology. If the operating system and criminals make use of technical loopholes, resulting in information or data loss, then the user's conventional operating system will have a serious impact and huge losses. In this case, we should constantly update and improve the operating system in time to ensure the safe operation of the system and strengthen the security of the computer network.

## **6. Specific Computer Network Security Technology Optimization Strategy in Big Data Environment**

### **6.1. Optimization of system and application of firewall**

First of all, we should emphasize how important the

firewall is. It can filter information, ensure the security of information, and try our best to avoid the damage of users' information on the terminal. The firewall settings can restore the computer to the protected state, which is relatively flexible, easy to use and easy to be protected. The system security directly affects the security of the computer network. The rigidity of the system makes it vulnerable to attack. The security of the central system will further strengthen the firewall technology. Therefore, the system should be updated in time to improve its weaknesses, and the firewall settings should be tracked in time. To cooperate to ensure the security of computer network.

### **6.2. Installation of antivirus software**

With the further development of computer and network, computer viruses and Trojans are becoming more and more difficult to identify, becoming diverse and complex, posing a serious threat to computer networks and systems. Installing antivirus software can effectively resist the invasion of viruses. Engineers analyze the types and attributes of viruses and take targeted protection measures. However, when anti-virus software can use computers to process information, it will first find out the source of viruses, screen them one by one, and then delete them according to users' needs. Moreover, installing anti-virus software can remind users to decide whether to obtain permission according to their own needs, so as to protect their personal information and data as much as possible. Check and kill computer viruses regularly, update virus database in time, improve security awareness, and improve the security of computer network and database.

### **6.3. Improve relevant laws and regulations**

Therefore, the problem of network security is caused by legal loopholes caused by some professionals' false consciousness, malicious destruction of computer systems and malicious acquisition of illegal interests. Therefore, relevant staff and institutions should improve the existing laws and technologies related to computer technology, strictly implement them, and seriously treat those who exploit legal loopholes and break the law. At the same time, the concept of computer network security should be deeply rooted in people's hearts, the importance of network security should be publicized and preventive measures should be taken to make it widely known.

### **6.4. Application of encryption technology**

In most cases, the computer management office is not managed by a fixed person. In this case, we should improve the awareness of information resource protection in computers and encrypt them. In addition, the location for encryption technology is also relatively wide, including account opening or file encryption, etc. At the same time, the application of computer encryption technology will not harm the normal use of the computer, but can better protect the information and data resources in the computer and ensure the security of the computer network.

### **6.5. Hardware facilities**

The computer network security problems caused by hardware equipment should increase the security measures related to the equipment. In the process of using hardware, because the hardware is tightly built, its security problems often come from external factors, especially external conditions and external environment. Therefore, in the

process of hardware installation, specialized human resources should be assigned to specialized management and maintenance personnel, defective hardware should be replaced or repaired in time, and reverse hardware should be updated in time; At the same time, the hardware can be stored in a suitable range to avoid external factors damaging the hardware equipment. Therefore, it is necessary to ensure that the hardware infrastructure can check the use of the hardware infrastructure and its surroundings safely and timely. Aging and damaged hardware must be replaced or dismantled in time. Choosing a suitable workplace can prolong the life of hardware.

## 6.6. Application of Identity Authentication

The characteristics of authentication show that users use some unique functions by providing personal attributes of specific data information. The so-called identity authentication is used to analyze and verify users' personal data or biological data, and to identify individuals by individuals, which will greatly improve the security of data and computers.

## 6.7. Optimize the data transmission mode

First of all, the security problems faced by network information and transmission records are mainly due to the fact that network crime steals, manipulates and destroys network information and data by technical means. Therefore, by further strengthening the stability of the data flow process, the security and stability of information data in the transmission stage can be ensured. To ensure the stability of network information transmission, encryption technology is often adopted in information transmission. Before data exchange, the receiver and sender of data transmission should make an encrypted log, so that it can be transmitted in some way in the network information transmission stage. Optimizing data transmission mode can improve the stability of network information transmission;

## 6.8. Update the operating system in time

The operating system should be updated in time, and its shortcomings should be effectively reviewed. Once the weak links are found, they should be repaired in time, so as to prevent them from being used by criminal gangs and undermining the stability of the system; At the same time, the firewall settings inside the system should be updated in time to strengthen the protection of information and data.

## 7. Conclusion

With the rapid development of information technology and computer technology, big data has begun to bring convenience to people's lives. The beginning of the era of big data is an important symbol of the progress of information

technology to some extent. In the environment of big data, the value of information data is further affirmed, the expansion of network functions is realized, and the transmission efficiency of information and data is also improved. At the same time, its own functions also have a certain impact on computer network security. With the rapid development of big data exchange technology, the security of computer network must also be strengthened.

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