

Analysis of Computer Network Security and Countermeasure Based on Big Data

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Keywords: big data; computer network security; Countermeasures

Abstract: With the continuous development of science and technology, computer network technology has made remarkable progress. Compared with the past, its hardware and software have undergone tremendous changes, which provide a very strong impetus for China's economic construction, and also provides a good condition for the arrival of the era of big data. The advent of the era of big data is the necessary stage after the development of computer network technology to a certain extent. In the era of big data, a large amount of data can be used every day. With the support of these data, all industries have achieved better development, but at the same time, it also brings a lot of security problems. Effective prevention and control can realize the good application of big data and promote the further development of the era of big data on condition that these security problems were solved. Based on this, this paper analyses the computer network security and Countermeasures Based on big data.

1. Introduction

Computer network security has existed since the birth of the network. But when the era of big data comes, this problem not only becomes more and more obvious, but also has a very close relationship with us. If the computer network has security problems, it will be very easy to leak information and bring serious losses to people. If this happens in the national security department, the information leaked and lost involves state secrets, its impact will be very terrible. Moreover, the computer network security problem is not conducive to the further development of the big data era, but also has an impact on the development of various industries. Therefore, it is necessary to analyze its security problems and countermeasures.

2. Overview of Computer Network Security in Large Data Environment

2.1 Main features of big data

The era of big data is an inevitable stage for the development of computer network technology to a certain extent, and it is also an inevitable trend of social development. In the era of big data, a great deal of information will be generated every day, which embodies the following three characteristics: first, the amount of data is very large, and the number of data stored and applied every day in the era of big data. Data volume is very huge, but also brought about constant changes in data statistics units, from the past MB to today's GB, TB and other data storage is increasing, all sectors of society have been further promoted by these data. Secondly, there are many kinds of data in the era of big data. Big data has no structural characteristics, and its data types are particularly complex. It must be processed by corresponding technical means in order to be effectively utilized. At present, various technical means to deal with large data are still developing, which also proves that large data has not been fully utilized and still has great value to be explored. Finally, the speed of data application in the era of big data is increasing. With the continuous development of technical means of processing and applying large data and the continuous progress of computer network technology, people can mine useful information in large data more quickly by corresponding means. At the same time, these information can be transmitted in real time, which lays a good foundation for the further development of large data¹. In addition, in the process of development, social

enterprises can quickly process and apply large data to predict the future direction of development, and then formulate more conducive to their own development strategy, so as to achieve the goal of rapidly occupying the market.

2.2 Computer Network Security in Big Data Environment

The computer network security in the big data environment is embodied in the following two aspects: first, the management system, refers to the formulation of corresponding management system for computer network security, so that the actual operation and related personnel can be effectively managed, so as to build a safe development environment for computer network. Secondly, information, refers to a great deal of information generated under the environment of big data every day. Besides promoting the development of computer networks, these information will also bring many security risks. Therefore, from the perspective of content, processing and application of information, we can improve the security of computer networks, so that sufficient guarantee for the development of computer network in the era of big data can be provided.

3. Factors of Network Security in the Age of Big Data

3.1 Computer system factors

In the era of big data, the development of computer network technology is rapid. However, technological means that can threaten computer systems have also developed rapidly, which determines that computer systems must be constantly improved and vulnerabilities patched in order to effectively resist threats. In addition, various kinds of software and hardware used in computer systems are also developing constantly, and these hardware and software installed in the same computer may have incompatible problems. Once these problems occur, it will not only affect the performance of the computer, but also easily lead to the collapse or information damage and loss to the system when dealing with large amounts of data, evidently, this will cause serious losses to users.

3.2 Information and data factors

Through the analysis above, we can see that in the era of big data, a large amount of data will be generated every day. At present, binary system is the main method to process and store these data, but using big data technology requires comprehensive processing and storage of different data. For a large number of mixed data, this method can easily lead to some data being destroyed, and then it cannot be applied any more. What is destroyed is some high-priced data, which will probably lead to very large losses.

3.3 Human factors

No matter what stage the computer network technology develops to, human factors are the main factors leading to its security problems. In addition to hacker attacks, human factors are also reflected in the following two aspects: first, operation and processing. If we want to make better use of big data, we must have corresponding operation technology. If there are defects in this aspect, we cannot excavate the potential value of big data, but also lead paralysis of computer network, loss and damage of data to it in the process of operation². Secondly, in the process of people's daily application of computer networks, it is very likely to unintentionally leak some information that has a great impact on us, which is likely to be used by interested people, and then pose a threat to us.

4. Computer Network Security Analysis in the Age of Big Data

Globally speaking, China is the most vulnerable to cyber-attacks. China's cyber-attacks are mainly concentrated in developed coastal areas, such as Shanghai and Guangdong, which are often attacked from home and abroad. According to statistics, attacks on computer networks in 2018 increased by as much as 200% compared with the same year. Among them, medium-sized attacks grew by as much as 120% and large-scale attacks by as much as 80%. Of all the industries that have

received cyber-attacks, the gaming and financial industries remain high, while attacks on government websites continue to rise (see Table 1).

Table 1 A Brief Introduction to Network Attacks

Types of Network Attacks	Growth ratio	Industry	Region
Large-scale attacks	120%	Game and financial industry, government website	Developed coastal areas
Medium-sized attacks	80%		

5. Countermeasures for Computer Network Security Based on Big Data

5.1 Optimizing and innovating computer network technology

First of all, the upgrading of computer network technology should be optimized, and the firewall and security protection house arrest in computer network system should be continuously improved. Based on the current computer and network technology, the most effective way to improve security is to improve the function of firewall and the means of security detection. The current computer technology can be used to upgrade the system firewall and security protection software, so that the related factors threatening the computer network system can be found in time and dealt with in time. In addition, in order to ensure the function of firewall and security protection software, it is necessary to update it regularly, and to improve the specific means of defense, so that it can be more targeted to prevent dangerous factors. Secondly, the research and development of computer should be optimized, which means to enhance the compatibility of computer network system both software and hardware, so as to avoid the system crash and data damage caused by incompatibility, and at the same time, we should constantly repair the system vulnerabilities caused by technological progress in this process, so as to make greater security.

5.2 Preventing attacks

Massive information generated in the era of big data has great potential value, and these values have also attracted the attention of interested people. For example, network hackers can make profits by stealing corresponding information, so network hackers have become a security hazard that must be prevented in the era of big data. In order to resist hackers' network attacks effectively, we can build defense models for different attack modes in computer network system, so that when the system is attacked, we can use corresponding means to stop it quickly and reduce the losses caused by hackers' attacks. In addition, most hacker attacks are caused by Trojan horses or viruses, so the anti-virus software in the system should be updated in real time to ensure that the virus library has the latest Trojan horse and viral information, as well as to scan and alarm potential Trojan horse viruses, so as to eliminate the problem of the system being attacked from the root.

5.3 Dealing with security issues from the perspective of personnel

It is necessary and effective to improve the security of computer network system from the perspective of personnel, it can be done from the following two aspects: First of all, the operator of the computer, if the computer operator's safety awareness is high enough, then it can operate under the requirements of the computer's safety operating rules, and can also improve the computer's defense ability. Computer operators' awareness of network security should be strengthened, so that they can avoid clicking on some automatically pop-up links and pictures in the process of using the network, and also avoid visiting some websites with Trojan horses and viruses³. In addition, to enhance the operator's security awareness, it is also necessary to make them know how to use antivirus software and system firewall effectively, and know how to upgrade relevant software and firewall regularly. Secondly, the training of computer professionals should be strengthened to solve various security problems in computer networks through professionals, which can promote the effective improvement of computer network security and realize the sustainable development of

computer network technology in the era of big data.

6. Conclusion

To sum up, China's network environment is relatively vulnerable, especially in the current era of big data, the explosive growth of information has also increased the probability of computer network system security problems, so it is necessary to improve the security of computer network system, so as to ensure the sustainable development of our society.

References

- [1] Wang Ronghua. Computer network security and Countermeasures Analysis Based on big data [J]. Journal of Jilin Radio and Television University, 2018, 20 (10): 13-14.
- [2] Fu Wei. Computer network security countermeasures based on big data background [J]. Farmer's Staff, 2017, 09 (24): 239-239.
- [3] Wang Qian, Pan Chen. Analysis of network security vulnerabilities and preventive measures based on the era of big data [J]. Network security technology and application, 2017, 18 (2): 56-59.
- [4] He Xiao. Implementation Strategy of Computer Network Information Security and Protection Measures under the Background of Big Data [J]. Art Science and Technology, 2019, 32 (07): 284-285.
- [5] Zhang Xinglin. Research on Computer Network Security and Preventive Measures in Big Data Era [J]. Information and Computer (Theoretical Edition), 2019 (12): 219-220.