The Role of Virtual Technology in Computer Network Security in Higher Vocational Education

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Abstract: After entering the 21st century, information technology has developed rapidly and has become an essential part of people's lives. The same is true in higher vocational colleges, the computer network greatly facilitates the development of teaching activities. However, with the continuous expansion of the application scope of information technology, network security issues have also followed. Therefore, a variety of measures must be adopted to protect the security of computer networks, among which virtual technology is one of the important network security protection methods. Based on this, this article starts with the current situation of computer network security in higher vocational colleges, first analyzes the security threats of computer network in higher vocational colleges, and then explores the effectiveness of virtual technology and its application in higher vocational computer network security, hoping to take this Provide certain reference opinions for high-level computer network security related research.

1. Introduction

Nowadays, computer network technology plays an important role in the teaching of higher vocational education, and higher vocational education has also set up a special website to facilitate students' credit inquiry and network teaching activities. In order to improve the quality of talent training, higher vocational colleges also set up special network security education. Of course, in order to protect the security of the computer network, higher vocational colleges have also adopted various measures, such as firewalls, to filter viruses and at the same time play a certain role in network attack protection [1]. However, judging from the current actual situation, the security of computer networks in higher vocational colleges still has certain hidden dangers. The overall computer network security protection level is low, and the technology adopted is relatively backward. Therefore, it is necessary to accelerate the pace of improvement in the subsequent development.

2. Security Threats to Computer Networks in Higher Vocational Colleges

There are relatively many security threats to computer networks in higher vocational colleges, which can be divided into the following categories:

(1) Hacker attack. Hacker attacks are the most common threat to network security. Hackers are more concealed and usually enter the computer system by illegal intrusion, which not only causes a lot of internal information to be leaked, but may also affect the computer network system. . Generally speaking, hacker attacks will combine system security vulnerabilities and use various illegal programs to achieve their goals. Such influencing factors have a great impact on network security, and may even lead to the paralysis of network systems.

(2) Natural factors. The impact of natural factors on computer network security is mainly reflected in two aspects: environment and human factors. Environmental factors mainly refer to the strong radiation and magnetic field in the geographic environment where the computer is located, which will affect the safety of computer use, A lot of performance cannot be effectively realized. Human factors mainly refer to the errors of computer operators, such as excessive garbage in the system and insufficient safety awareness due to operation, which will also reduce the safety of

computer network use.

(3) Authorization factors. Part of the computer software is illegally authorized during installation, which is the biggest risk factor in current computers. Because the software involves the various processes of computer operation, it enhances the operational risk of network security. Many criminals use viruses implanted in software to obtain illegal authorizations, and then attack computer network systems, causing major problems such as information leakage. Especially for higher vocational colleges, the computer network system saves the private information of many students and teachers. If it is obtained by criminals, it is likely to have a huge impact.

(4) Viral factors. Computer viruses are not uncommon nowadays. They were created shortly after the birth of computers and have a great impact on the security of computer networks. This is because computer viruses are the most direct and destructive. In addition, computer viruses also have a strong spread, directly affecting the integrity and stability of the computer network system, and even some viruses can cause hardware damage [2]. Judging from the current actual situation, computer viruses are highly concealed and latent. Many viruses can effectively hide after invading a computer, and then spread in a wide range, which in turn causes computer data to be distorted and modified. Viruses directly target system programs and paralyze the entire computer network system, such as "Bitcoin virus" and "Panda burning incense".

3. The Effectiveness and Main Types of Virtual Technology

3.1 The Effectiveness of Virtual Technology

Virtual technology integrates many modern technologies such as man-machine interface technology, computer simulation technology, and computer graphics. It can realize the combination and differentiation of computer resources, thereby optimizing the internal resource configuration of the computer system, and transforming physical resources into manageable logic Resources. With the help of virtual technology, the physical structure barriers of computer network systems can be broken. Realize the automatic allocation of resources, so it can effectively play a role in network security protection. Reduce virus and malicious software attacks, and make computer network operation more secure and stable. Especially for relatively large network platforms, the use of virtualization technology can effectively achieve the coordination of servers and operating systems, and the use of virtualized operating environments to optimize security management. Moreover, users of computer network systems do not need to spend money to build data centers, so it is very common in current network security management. In addition, virtual technology can be integrated with a variety of modern technologies to enhance the operability of data with the help of visual management, which is also of great significance for improving the stability and security of computer network operations [3].

It is precisely because of the above-mentioned advantages of virtual technology that it has been rapidly applied to various fields since its inception, and is now widely used in scientific and technological research and development, medical industry, entertainment industry, education field and military field. Of course, virtual technology also has its own limitations. On the one hand, its poor compatibility needs to ensure compatibility between the new and old systems when migrating the system, and the other side needs to stop when performing maintenance, upgrades and expansion. Of course, the virtual technology is constantly improving and perfecting, I believe these problems will also be effectively resolved.

3.2 Main Types of Virtual Technology

Virtual technology mainly includes the following types:

(1) Hardware mode. The hardware model refers to the virtual technology that establishes the computer's network hardware and storage into a virtualized platform, and then multiple applications and operating systems can operate simultaneously. With the help of the virtualization layer, all devices of the computer can be virtualized, such as CPU, motherboard, chip, memory, etc., so that the independent packaging of the network system is realized, not only the data migration is more

flexible, but also the security is effectively guaranteed.

(2) Operation mode. The operating system of the network system host can also be virtualized with the help of virtualization technology, which can effectively realize the sharing of software and optimize the management of network resources. In the virtual process, a dedicated virtual layer isolated from each other will be established in the server. Each user has an independent platform, and the IP address files, applications, permissions, etc. of different users are different, so that the system can be effectively enhanced the safety of use can also reduce consumption and improve the efficiency of network security management.

(3) Para-virtual mode. The para-virtual mode can enhance the flexibility of system management, facilitate users to selectively modify the operating system, and it can simulate most of the real characteristics of the virtual machine. Judging from the current actual situation, para-virtualization technology is still in the process of rapid development, so there may be some problems in compatibility when using it. However, para-virtualization technology still has its own unique advantages, which is useful for enhancing network security management operations. Flexibility has important meanings.

4. Application of Virtual Technology in Computer Network Security in Higher Vocational Education

Virtual technology is of great help to the improvement of computer network security. Therefore, it can be used in the management of computer network security in higher vocational colleges, with its own advantages to enhance the stability and security of higher vocational computer network operations.

4.1 Simulated Operation of Computer Network

Virtual technology can be applied to the simulated operation of high-value computer networks. With the help of virtual technology, the client computer and the host computer are separated and grouped into different architectures, so that independent operation can be used to effectively protect. In this way, even if a virus invades subsequently, it can effectively curb the spread of the virus, thereby enhancing the security of the computer network system. For higher vocational colleges, its network platform mainly serves students and teachers, but the number of teachers and students in the school is relatively large, and it is likely that a computer carries a virus and brings security risks to the server materials [4]. With the help of virtual technology, this problem can be solved well. The access equipment of students and teachers can be isolated from the school platform, and independent operation can be realized with the help of different architectures, thereby effectively reducing the risk of virus infection and enhancing network system operation the stability and security.

4.2 Creation of Shared Files

For higher vocational colleges, their computer network contains this important information, such as school decisions, personal information of students and teachers, etc. During the operation of the network system, data will be transferred between computer terminals, so there is a corresponding risk. If it is maliciously attacked, it may cause information leakage. In this regard, virtual technology can be used to create shared files to store important information, and then set up corresponding firewalls in the shared files to achieve network security protection and avoid information leakage during transmission [5]. In addition, encryption can be performed during information transmission to further improve the security of information transmission.

The advantage of using virtual technology to create shared files is that it separates important information, and uses hierarchical protection to enhance its security and realize the distinction of information. In the specific application process, access to shared files requires corresponding permissions, and there are also certain requirements for accessing IP, etc., so it is difficult for hackers to break the security protection system and play a role in information protection. In addition, virtual technology does not require large-scale data centers as support, and its own

capacity is relatively large, so it can also reduce the investment in network security of higher vocational colleges.

4.3 Interconnection of Subsystems

For higher vocational colleges, multiple subsystems will be set up when building a computer network system, which can facilitate the independent management of different colleges. However, independent management will bring about the problem of connection between different subsystems. At this time, virtual technology can be used to closely combine the subsystems and use the virtual layer to realize the information transmission of the subsystems, so as to avoid other channels. Security risks of information transmission.

4.4 Teaching Application

Virtual technology can not only be applied to the security management of computer networks in higher vocational colleges, but it also plays an important role in the optimization of teaching. This is because virtual technology is a fusion of multiple technologies. It can use virtual instruments to realize virtual display, so that it can effectively optimize the teaching process and use modern methods to carry out teaching activities. For example, with the help of a virtual reality system, graphics such as VR and 3D can be output, and realistic models can be displayed directly in front of participants. At this time, complex theoretical principles can be clearly displayed, and students can intuitively feel the entire process. It has a positive meaning for enhancing the understanding of the theory. From this point of view, virtual reality technology can enhance the interest of teaching, so it can effectively stimulate students' enthusiasm for learning, especially in disciplines such as architectural design, urban planning, biomedical engineering, etc. The demonstration of virtual technology can be more intuitively expressed the shocking scene realizes the interaction of teaching. Of course, virtual reality technology is not yet mature enough, and professional virtual tools are needed to display the scene, such as mechanical feedback, data gloves, and free space mouse, but this can be the direction of future development of vocational colleges.

After entering the 21st century, the country vigorously develops science and technology, and the teaching of colleges and universities has been greatly improved compared with the past. The continuous application of various advanced technologies and equipment in teaching activities has not only effectively improved the quality of teaching, but also enhance the learning experience of students. From the above analysis, we can see that virtual technology can be used in teaching activities, which may become an important direction of teaching reform in the future. Therefore, we can increase the research efforts in this area and continuously integrate virtual technology in teaching to improve teaching quality. Based on the development of diversified teaching activities and optimizing teaching methods, virtual technology can play a greater role.

5. Conclusion

With the continuous popularization of computer networks, its security problems have become more prominent. Especially for higher vocational colleges, their computer networks contain important information and data. If information leaks, it is likely to have a huge impact. Diversified means to ensure network security. Virtual technology can realize the optimal allocation of resources, and can also break the barriers of the physical structure of the computer network, so it can effectively play a role in network security protection, with the help of hardware mode, operation mode and para-virtual mode to improve the security of computer network operation Sex. This technology can be introduced into the computer network system of higher vocational colleges to improve the safety of its own operation by means of running simulation, the creation of shared files, and the interconnection of subsystems. In addition, the application of virtual technology can be further deepened, and the technology can also be introduced in teaching, thereby effectively improving the quality of teaching.

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