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A Research on the Application of Virtual Network Technology in Computer Network Security

Kun Qi*

Shenzhen Polytechnic, Shenzhen 518055, Guangdong Province, China

***Corresponding author:** Kun Qi, 38995273@qq.com

Abstract: In the computer field, network security is a crucial integrant. It is necessary to pay attention on the application of virtual network technology, so as to raise the standard of computer network security to a new level [2]. In view of this, this paper will analyze the application of virtual network technology in computer network security and propose some strategies for future reference.

Keywords: Virtual network technology; Computer network security; Application research

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1. Overview of virtual network technology

1.1. The characteristics of virtual network technology

The term "virtual network technology" can be defined as follows: the virtual network link contained in the computer network, which can be regarded as an important premise and key guarantee for the safe operation of the computer network [1]. By introducing virtual technology into the computer network, the network security level will greatly improve; certain complex links and programs in the computer network can be omitted, and the network operation will be more convenient, with a lower cost [2]. At the same time, the application of virtual network technology to computer network can facilitate enterprises to better carry out their work and expand their businesses. Furthermore, virtual network technology has developed a significant competitive edge in the market since it generally does not involve too many devices [3].

1.2. The types of virtual network technology

With the development of the times, the overall information technology level in China has seen a remarkable growth, which promotes the development of virtual network technology. There are three types of virtual network technology in China. One of it is key technology, which can provide a strong guarantee for the transmission and sharing of information. The second is tunneling technology, which can encapsulate the local area network (LAN) to build a packet editing channel. The third is encryption technology, which can convert files into unreadable codes, so as to prevent information leakage [4].

1.3. The status of virtual network technology application

Virtual network technology is unique, and it has many advantages over other technologies. Generally speaking, computer network security is not considered "real" security work. It primarily affects the security of user data on computers and involves multiple societal interests [5]. In China, the application of virtual network technology in computer network security is comparatively limited, and its functions have not been

effectively expanded. There are significant restrictions, most of which apply at the basic level. At present, the internet can be used to search for most information [6], including personal information. It is difficult to protect personal privacy because of the inadequate application of virtual network technology in the network, which leaves numerous pieces of information lacking commensurate restraints and being used too casually by users [7]. Therefore, it is important to place a higher value on network security technology. If personal information cannot be protected, criminals can easily exploit this information for various purposes, which may infringe on the safety of people's lives and property, resulting in economic losses to these parties [8].

2. Analyzing the factors affecting computer network security

2.1. Unauthorized access

Illegal authorized access generally refers to the use of self-made programs and software by criminals to obtain the access rights of individuals and enterprises to computer network programs, without the authorization and permission of the user [9], in order to steal valuable data or information [10]. Illegal authorized access is often realized by changing the access rights of certain programs. It will not only infringe on the user's information security and data security, but also cause certain damage to the computer system and affect the stability of the computer's operation, resulting in the collapse of the system [11], as well as economic and property losses [12], respectively.

2.2. Computer virus

There is an essential difference between computer virus and biological virus. The former mainly refers to the stealing of data contained in computers with the help of certain application programs, which will leave a negative impact on the operation of other applications or even lead to computer operation errors as a result of code identification issues [13]. Computer viruses have certain latent and destructive characteristics. They may be viewed as hidden and huge threats to the computer network security that is widely used on a daily basis [14].

2.3. Trojan horse programs and backdoor programs

Trojan horse programs generally refer to the use of computer technologies by criminals to attack users' computer equipment and network remotely, so as to bypass administrator rights or invalidate the rights, thus leaving the computers in an unprotected state [15]. With the help of Trojan horse programs, criminals can steal and operate the data and software on users' computer, which pose a huge threat to computer security. Currently, common Trojan horse programs fall under the category of backdoor programs; in particular, they enable an attacker to gain remote access to a computer. They are extremely concealed and destruction.

3. The application of virtual network technology

3.1. Between enterprises and customers

Virtual network technology has been widely applied by enterprises. It brings convenience to enterprises' day-to-day businesses and enhances their computer network security. In some areas, the computer network security level of enterprises will greatly affect their cooperation with customers. A high-level computer network security is an important basis for enterprises to maintain customer relations [16]. Generally speaking, in a cooperation, data and files will be transferred, in order to achieve mutual benefit. In this data sharing process, the application of virtual network technology helps protect customers' privacy and prevent personal information leakage. In addition, it can also be used to build a temporary login client, which brings convenience to users while looking for data and materials, evades the trouble of data transmission, and establishes a more efficient data link, so as to improve the economic benefits of enterprises. Moreover, the

application of virtual network technology in computer network security can enhance the firewall, verify customer information, prevent mistakes in data exchange between customers and enterprises, reduce information transmission obstacles, and improve cooperation efficiency [16].

For example, some enterprises send data to customers regularly. Without virtual network technology, these data are likely to be used by criminals in the transmission process, resulting in the loss or modification of data. This will not only cause business security problems, but also affect the service experience of customers, which is not conducive to the sustainable development of enterprises. By introducing virtual network into this process, it can greatly improve information security, enable customers to better experience the services of enterprises, and effectively guarantee data security, which plays an important role in further promoting the development of enterprises. From here, it can be acknowledged that virtual network technology plays a huge role in the cooperation between enterprises and customers, which is also a key step in the burgeoning of a modern information society.

3.2. Between enterprises and branches

A number of enterprises have applied virtual network technology to their own computer network security work, but it is undeniable that at present, the computer network security level of most enterprises in China still has room for improvement, and some enterprises are still facing problems with their network security. Therefore, in addition to the application of virtual network technology between customers and enterprises, this technology should also be applied to the coordination between enterprises and branches, so as to improve work efficiency [17]. Through the application of virtual network technology, the information security level of both, enterprises and branches would improve, thus enabling the latter to manage their own computer security problems and preventing the infringement of hackers and viruses on corporate computers and database resources. In addition, by being more attentive to their computer network security issues, enterprises would be able to identify the vulnerabilities in their computer systems in time, thus guaranteeing early detection, prevention, isolation, and termination of loss [18]. In order to successfully link all branches of an enterprise and improve information flow, it is necessary for all departments to achieve the effective sharing of network information resources. To do this, it is necessary to be adept in applying virtual network technology into the enterprise's LAN. In addition, when applying remote technology, enterprises can also use virtual LAN to realize cross regional cooperation and operation. In practice, hardware virtual network technology can be used to enhance the security of corporate information and improve the efficiency of data transmission.

In some enterprises, a large amount of data will be stored in their own computer database. If these data are stolen, the impact on the operation will be significant. For example, in supermarkets, if their data information is modified, it will affect the goods inventory, goods calculation, capital statistics, and other work scopes. It will even have an impact on the authenticity of some crucial information, which will cause a fatal blow to their operation and development. In addition, departments should also consider using the network to communicate, owing to the scale of some businesses. The occurrence of data theft during the transmission process may cause department leaders to make wrong judgments and lose business opportunities, which will greatly hinder the proximity in communication and the effectiveness of cooperation among departments in an enterprise. From here, it can be seen that in order to promote the rapid development of enterprises, it is necessary to place more emphasis on the application of virtual network technology, so as to promote efficient cooperation among departments, realize the rational utilization of data resources, and improve the operation of enterprises.

3.3. Between enterprises and employees

At present, although some enterprises have been applying virtual network technology in their businesses,

these applications are generally at the basic level. They have failed to carry out in-depth research on its functions and have limited the role of virtual network technology in various corporate endeavors. In the long run, it will be difficult to guarantee the security of enterprises' computer network. Therefore, enterprises should focus on expanding the application of virtual network technology to all levels of daily work [19]. At present, many enterprises are sending their employees to other regions to work, which makes it difficult for employees to make full use of all kinds of data on the intranet, thus affecting work efficiency. These enterprises should use virtual network technology to design private networks and provide information security to foreign employees through the installation of firewalls and other functions, so as to prevent the infringement of corporate information and data. Moreover, with virtual network technology, employees would be able to share resources with their enterprises wherever they are, which is of great significance to improving work efficiency.

Not only that, due to the poor awareness of some employees on preventive practice, if they are not careful when using the external network while carrying out their duties, they will be easily taken advantage of by computer viruses, which will cause a devastating blow to the enterprise's data information. Therefore, in applying virtual network technology, by means of network encryption and firewall optimization, enterprises should consider the levels and positions of different employees and issue corresponding permissions to them, so as to prevent criminals from infringing on the enterprises' information. In addition, by reasonably applying virtual network technology to corporate businesses, employees will gradually form good network usage habits and improve their awareness on preventive practice, which play important roles in promoting the efficient use of network information. From here, it can be seen that the application of virtual network technology to daily operation and management will greatly promote the development of enterprises and their employees, which is crucial to enhancing the effectiveness of business operations and the productivity of employees.

4. The application effect and development prospects of virtual network technology

Applying virtual network technology to computer network security has a positive impact on enterprises and ordinary computer users. In practical application, many users have claimed that the application of virtual network technology guarantees information security and effectively reduces the impact of malicious software, such as hacker intrusion, virus, and Trojan horse, thus maintaining the stability of their computer system [20]. For enterprises, the application of virtual network technology in computer network security can effectively ensure the security of data and information, identify computer system vulnerabilities, and address potential threats at their source. This enhances the enterprises' network security and prevents infringement by criminals. In the future, computer network security personnel should continue to deepen the research on virtual network technology, address current issues, improve the application of virtual network technology in computer network security, continue to optimize virtual network technology, provide better protection for enterprises and users, as well as generate greater social benefits [17]. Through in-depth investigations on virtual network technology, its development prospects will become broader, which will significantly improve China's socialist economic construction level.

5. Conclusion

In conclusion, in order to improve the application of computer virtual network technology in computer network security, it is critical to first comprehend the concept of virtual network technology and clarify the factors affecting computer network security before exploring the practical application of virtual network technology in enterprises, which aims at the application of virtual network technology between enterprises and customers, enterprises and branches, as well as enterprises and employees, in order to bring the application of virtual network technology in computer network security to a new height.

Disclosure statement

The author declares no conflict of interest.

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