Discuss the Security Countermeasures and Data Protection of Library Computer Network

Wanchun Guo1,*

1Wuhan University of Engineering Science, Wuhan, Hubei, 430200, China

*Corresponding author e-mail: guowanchun236@wuhues.com

Abstract. With the development of computer networks, the management and operation of the library are gradually becoming networked. And the network management model has greatly improved the management efficiency of the library. Of course, the computer network also makes the library's data have hidden dangers. This paper mainly analyzes the library computer network security problem and the improvement measures of the library computer network security problem.

Keywords: Library, Network Security, Prevention, Countermeasures

1. Introduction

With the rapid development of the network, the application of network and digital resources in libraries is also becoming more and more extensive. When readers are using the library’s network and resources, the security issues of the computer network continue to affect the reader’s normal use. Therefore, libraries should focus on the hidden dangers of computer network security. Computer network security is already a very important part of library management.

2. The basic definition of library computer network security technology

The security technology adopted by the library computer network specifically refers to the adoption of some related security measures and management measures, etc., so that the digital system hardware equipment and computer software systems formed by some computer networks within the library are not affected by the outside world. Interference and destruction. At the same time, it can effectively prevent these data from being threatened, wanton changes, data loss, and so on. This can ensure that the computer network can run and work in a safe and stable environment, so as to provide users with the most efficient and high-quality digital services [1]. The characteristics of the library’s computer network security are shown in Figure 1.
3. The importance of library computer network security

In the information age, libraries have widely used computer networks to replace traditional office methods. The popularity of computer networks has not only greatly improved the management level and office efficiency of the library, but also provided readers with more convenient service methods. However, the hidden security hazards in the computer network will also affect the normal development of library business office and reader services. At the same time, it will have an adverse impact on the development and utilization of digital resources in the library, and will easily affect the enthusiasm of readers to use library resources [2]. Therefore, while using the computer network, the library must continue to pay attention to the problems of computer network security. It must take the initiative to do a good job in the inspection and prevention of network security to ensure the stable and safe operation of the library's computer network system.

4. The main factors affecting the safety of the book network

To ensure the security of the library's computer network, we should focus on analyzing several key factors that affect the security of the computer network. These key factors mainly include hardware, software, man-made and environmental factors.

4.1. Hardware factors

The hardware equipment is the main component of the computer, and the performance of the hardware equipment has a significant impact on the security of the library network. In the library computer network hardware, various switches and servers are indispensable hardware devices in the entire system. If these devices are not carefully checked on time, once these devices fail, the entire computer network will fail, or even Causes the entire network to be paralyzed and cannot continue to operate.

4.2. Software factors

Software is generally divided into two categories: operating system and database. The operating system now generally uses Microsoft's Windows operating system. The system has the advantages of simple operation and convenient configuration. However, due to the popularity of its application, there are many vulnerabilities discovered, and it is vulnerable to attacks by various hacker programs. Even if the latest security patches are installed, it is still easy to be attacked. Object. The security of the database is

![Diagram showing the characteristics of library computer network security]

Figure 1. The characteristics of library computer network security
first of all the security of the database platform [3]. Similar to the operating system, these management platforms also have certain security vulnerabilities; secondly, the database has errors in the settings of user roles and management permissions, so that some users who do not have access rights can illegally obtain data in the database.

4.3. Human factors

The technical level of library network administrators determines the level of computer network security. However, a considerable number of library computer network administrators lack systematic network security education and neither understand the basic knowledge of network information security nor understand the maintenance technology related to network security. Especially when a problem occurs, there are still some shortcomings in how to solve the problem quickly and effectively, which will lead to an increase in the risk of the library’s computer network system [4].

4.4. Environmental factors

The computer network system also has high requirements on the external environment where the hardware equipment is located. If the external environment is not constructed in accordance with the corresponding standards, it may also endanger the security of the entire network. Many libraries attach great importance to the investment of hardware equipment when building computer networks, but the investment in the construction of the related external environment is very limited. Especially for the impedance of the network, the grounding of electronic equipment, the storage of disk arrays, and various safety protection measures against water, dust, lightning, fire, static electricity, and magnetic fields, there is a lack of corresponding capital investment and preventive plans. All of these may cause damage and paralysis of computer networks.

5. Plan to improve the safety of online log in college library

Through the above analysis of the importance of library computer network security and many factors that cause network security problems, the following mainly discusses how to deal with these problems and some solutions after network security problems occur.

5.1. Improve the ability of anti-virus

In the use of computer operating systems and business platforms, some anti-virus software with high protection performance and thorough virus detection is used to resist the influence of viruses on the network system. In addition, network management personnel should conduct inspections on the various business platform systems in the library on time to prevent the emergence of computer viruses. Once a computer virus is discovered, it should be prevented from spreading in the network system in time to prevent the entire network system from being damaged or even appearing. The emergence of the entire network system crashes [5].

5.2. Use firewall for protection

The use of firewalls to protect computer networks is an important means to ensure network security. By setting and turning on the firewall, the computing facilities in the local area network can be effectively protected to ensure that users outside the local area network cannot access the relevant information in
the computers in the local area network. It will also prevent some attacks that may threaten the computers in the local area network at the same time. Through the application of firewall, the security of the entire computer network can be enhanced, the information security within the local area network can be more guaranteed, and the interference of undesirable information from the outside world can be avoided.

5.3. Intrusion detection technology

Intrusion detection is an important technical means to ensure the security of computer data [6]. The library can adopt an active intrusion detection system. The structure of the system is shown in Figure 2.

![Figure 2. Schematic diagram of the system structure](image)

The system mainly detects the host and local users, and finds out abnormal phenomena based on audit data and logs. Its application advantages are reflected in the following aspects: it can determine whether the attack is successful; it can monitor the specific activities of the host; it is suitable for The environment of network switch and encryption technology; no need to configure other equipment. Among various computer data security protection technologies, intrusion detection is a proactive method that can protect against internal and external attacks and misoperations in real time. When the computer network system is invaded, it can be intercepted [7]. In view of this, Libraries should make reasonable use of this technology to improve the security of computer data.

5.4. Strengthen the construction of network security system

Study and formulate various rules and regulations for library computer network security, establish a set of effective rules and regulations on the operation and control of computer network security measures and implement them effectively, so that responsibilities are clearly assigned to people; standardize the process of network operation behavior, Establish a network security supervision system and increase the intensity of inspection; establish and improve an emergency system for network security failure response, such as emergency response specifications and network failure recovery procedures, and deal with sudden network problems in a timely manner, and solve problems in a timely manner to ensure the entire The normal use of the network system.
5.5. Improve the safety awareness of managers

The current focus of the construction of some libraries is mainly the digitalization and network construction of the library, but there are still some shortcomings in the importance of the library network information security, especially the security awareness of some network managers is still relatively weak. All have caused hidden dangers to information security to a certain extent. Therefore, in order to completely solve the problem of library network information security, it is necessary to improve the monitoring level of network security and the ability of network security protection. Only in this way can it be ensured that the library can respond promptly and effectively when there is a problem with the network security of the library, and completely solve the problem of network information security [8].

5.6. Encrypt information

During the operation of the library information network, it is necessary to effectively protect the information in the network. Generally, the information is encrypted, mainly including the encryption of the transmission process, the encryption of the stored information, and the use of key management methods. Ensure effective protection of information security during the operation of the library network. At the same time, it is necessary to fully improve the application of various security management technologies in the network, and install necessary Trojan horse virus detection software to effectively prevent various Trojan horse viruses from invading the network and attacks by unauthorized users on the network.

5.7. Develop an emergency recovery plan

In order to respond to possible attacks and damages to the computer network system in a timely manner, a detailed emergency response and emergency recovery plan should be formulated. When a major network information security problem occurs, the emergency plan will determine the response. A complete emergency recovery plan can promptly and effectively restore the damage to the computer network system to a normal operating state, and at the same time can identify the root cause of network security risks in time [9,10]. For the failure of a single system or device in the network, as part of the emergency recovery plan, the environment of the entire system should be carefully checked to clarify the impact of any subsystem or device failure on the entire network and restore the device in a timely manner within the specified repair time run.

6. Conclusion

All in all, there are too many important information in the university library computing system. If information is damaged, it will not only bring irreparable losses to the library, but also affect the normal reading life of college teachers and students. In order to ensure that library computer data is not leaked, we need to adopt a series of protective technical measures to ensure the safe operation of library computers. Only in this way can we provide safer and more efficient library services for teachers and students.

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