Computer Network Security Technology Based on Java

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Abstract. With the rapid development of Internet, network security occupies the primary position in computer technology. It is mainly to ensure the security of information, can make the information in the network safe transmission. Next, also want to prevent the invasion of soft virus infection. At present, there are many kinds of technologies to maintain network information security. Such as firewalls, anti-virus software technology, file encryption and digital signature technology. This paper describes the vulnerability of network security and the importance of maintaining its security, mainly study the role of Java in computer network security technology and its application in which, finally based on Java network security technology and some other comparison, draw its advantages.

Keywords: Java Technology, Network Security, Computer Technology, Network Technology, Java Programming

1. Introduction
With the development of science and technology, computer network technology has been widely used in the social work, in order to ensure the quality and efficiency of work, network security technology has become particularly important. The technologies used to ensure their safety fall into three categories:

(1) The firewall.
Firewall technology as a special network interconnection device, its main function is to strengthen the access and control between networks, prevent the Internet users to enter the Intranet illegally, access Intranet resources, so as to protect the operating environment of the Intranet [1].

(2) Antivirus software technology.
Anti-virus software is a high efficiency of security technology is also the most widely used one way, anti-virus software technology continues to develop, at present more advanced anti-virus software can prevent Trojan horse and other hacker program invasion.

(3) File encryption and digital signature technology.
File encryption and digital signature are combined with network firewall technology. It is one of the main technical means to improve the security of information system and data and prevent secret data from being stolen, intercepted or destroyed by the outside world.

At present, there are mainly the following vulnerabilities in network security (See Figure 1).
2. The loophole of network technology security the importance of maintaining computer network technology security

The increasing use of the Internet, mobile phones and computers in today's society means more and more problems. Network use base increases, the loopholes appear uneven. According to the data, the number of information leakage is soaring, data leakage has brought a lot of inconvenience to people, even a huge loss of property. In order to protect people's information security, network security technology plays a huge role. To ensure the security of computer network technology is necessarily very important. The following is the research and discussion of computer network security technology based on Java.

3. The characteristics of Java language and its application in computer network security

Java has a wide range of applications and can also run cross-platform (JRE is available). The Java language is simple and easy to use, and its object-oriented characteristics make it unnecessary to face complex processes [2]. What we should pay attention to is the manipulation method of data. Network security technology although there are many ways, but with the support of Java technology, network security also do not have an advantage.

(1) The simplicity of the language makes security techniques less complex.

The integration of Java language and C++ is to take its essence and discard its dross, learn and absorb its excellent characteristics, and abandon its difficult parts. It can automatically process information, users do not have to worry about storage management problems, computer technology has strict rules, set up the program can ensure the safety of the network.

(2) object-oriented.

It is one of the object-oriented programming languages. It also has an extended collection of classes for programmers to pay more attention to data and the ways in which it is manipulated. Various packages can be made up of this collection, and ordinary users can use it in their own programs [3]. This makes it easier for most people to keep their Internet safe without having to worry about their own difficult syntax.

(3) distribution.

Java is a distributed language and is widely used on the network. It supports all levels of network connectivity, so users can generate distributed clients and servers. The network is a distributed vehicle for software applications. Java programs about maintaining network security can be written once and run anywhere.

(4) portability.

The Java environment itself is portable to new hardware platforms and operating systems. Java compilers are also written in Java, while the Java runtime system is written in ANSIC. Fixed programs are written to be portable, which means that the platforms used for coding are broad and diverse.
(5) A high performance. The designers of Java programs create "just-in-time" compilers that simultaneously translate Java bytecode into machine code for a particular CPU (central processing unit) at run time, that is, achieve full compilation. Implementing fully compiled bytecode is faster at run time and has significant security benefits.

4. The role of Java in network security technology and the security problems in the network

4.1. The role it plays in this technology
Java technology emerged in 1995 as an entirely new type of language that enables programming across different platforms. It mainly has four parts, namely programming language, program interface language, class file and Java virtual machine. Its object-oriented, portable, simple code and other characteristics, so that it can be compatible with multiple platforms at the same time, which is a great help to the programmer's design and development. Moreover, the unique security policy of this technology can effectively avoid malicious code, which is very important for maintaining the security environment of the Internet.

Both companies and individuals need to be protected online. What individuals need to be protected is the security of information transmission and personal identification information. The disclosure of personal information can lead to fraud. PCS and mobile phones have their own security rating before they leave the factory, and only when the rating is met can they be sold [4-5]. The security of every system in the company is very important, including the employee information system, the financial system and the company's important file transfer system. The security of these systems is guaranteed by preset Java programs and other languages, and some fixed programs can be changed to become the guardian star of other systems.

4.2. What security problems exist in the network and how to prevent them
Exists on the network security problems are various, even though they have set a good program can bring to our network security protection, we have to start from their own, do not disorderly registration information, avoid unknown links, many computer viruses are spread through links, the moment when you clicked on the link, the worm may already into your computer, Tampering and manipulating your computer's data and information. At present, most of the network security technology has done the virus discrimination and clearance. Only a few confused viruses are more difficult to identify [6]. All computers and mobile phones have security scanning system, computer butler and mobile phone assistant is not only convenient but also high check, they all belong to software operation. There are a growing number of similar security scanning and repair systems, all in different forms but also tied to Java and other technologies [7]. Different technologies support the software to make the network environment safer and cleaner. Commonly used formal anti-virus software can also prevent the emergence of security risks.

The programming language of Java technology is object-oriented, and programmers need to understand some of its formats and fixed collocations during design and development. When it uses set List, some commonly used functions are as follows (see Figure 2):
Figure 2. Commonly used functions

The ArrayLists above all implement the LinkedList interface, with three major differences:

1. The ArrayList data interface is index-based, and arrays are its underlying type [8]. It can randomly access elements in order of $O(1)$ time. The underlying LinkedList, in contrast, is a list of elements, which stores its data as a list, with each element linked back and forth, and in this case the time to find one of them is $O(n)$.

2. LinkedList inserts, adds, deletes, and modifiers are much faster than ArrayList because there is no need to update the index or recalculate the elements as an array does when they are added anywhere in the collection.

3. LinkedList takes up more memory than ArrayList because LinkedList stores two references for each node, one to the previous element and one to the next.

In Java programming, if you need to add an arithmetic sequence summation class to get the result, the principle is the same as algebra summation (formula 1).

$$\sum = n \left( n - 1 \right) / 2$$  \hspace{1cm} (1)

5. Java-based network security technology and other network security technology comparison

Other network security technologies include: firewall, anti-virus software technology, file encryption and digital signature technology and LAN security protection, the following is mainly based on Java network security technology and LAN security protection technology comparison.

1. The operating environment is different. Java-based network security technologies are sustainable and, as mentioned above, Java programs for maintaining network security can be written once and run anywhere [9]. While LAN technology requires a reconfiguration of the network and environment, Java programs are much easier to use.

2. The scope of application varies. Java can be used across the entire network (as long as there is a Java program running environment), with universality. The security protection of LAN technology is only useful under a network segment or subnet, which is somewhat narrow in the applicable scope. This is not to deny the technology, but Java is a relatively suitable technology for computer network security.

3. Performance implementations are different. Java implements full compilation with high speed and performance [10]. The LAN runs at a limited speed, and its performance is slightly worse than Java programming technology. With the help of high-performance programming, the efficient development of network security technology is just around the corner.

In summary, Java programming has a great advantage in terms of network security technologies.
Figure 3. Advantages of Java programming

6. Conclusion
From the above, with the rapid development of the network, the security of computer network technology is one of the most important parts. In this paper, the advantages of Java language and its application in network security and the degree of security it and other ways to maintain network security are compared, highlighting the advantages of computer network security technology based on Java. As ordinary users, we can also get its background protection, although we do not have access to the core content of Java technology, but when our security is guaranteed, naturally also feel at ease, Java has brought us do not have to worry about information relative security of the era, but the necessary awareness of prevention still have to have. In general, Java technology plays a better role in network security than it does on its own. Under the mature and extensive application of this technology, China's computer network security technology can be further improved.

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