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# Analysis on the Role of Network Security Protocol in Computer Communication Technology

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**Abstract.** With the rapid development of Internet, network security protocol plays an increasingly important role, which will enhance the security and stability of computer communication. Network security protocol can control the application process of computer communication technology, which will improve the computing communication environment. Through security protocol, we can guarantee the security of computer communication technology. In CTC system, this paper analyzes the practical application of computer security protocol. Through security protocol, we can guarantee the practical application effect of computer communication technology, which will promote the strengthening of security protocol in the future. In practical work, the security protocol will transfer information and data through a variety of methods, such as key distribution, identity authentication, data encryption and so on. Firstly, this paper analyzes the common security protocols. Then, this paper analyzes the role of security protocol.

**Keywords:** Network Security Protocol, Communication Technology, Function

## 1. Introduction

At present, China has entered the information age. Therefore, advanced network technology, computer technology and information technology have been applied to all walks of life, which has changed the traditional mode of production, life and management. Through information technology, we have greatly promoted economic growth and social development. Security protocol is sometimes called cryptographic protocol, which is a main technology to build network security environment. However, security protocol can't make the network completely secure. Since the 20th century, security protocol has become a research hotspot of scientists, which has been widely used in computer technology. With the expansion of computer application, computer communication security has become the main factor restricting the development of network<sup>[1]</sup>. As the Internet becomes more open and general, there will be more information leakage danger in network communication, which needs to be monitored through security protocol. Through security protocol, we can further ensure the security and efficiency of computer communication.



## 2. Common security protocols

### 2.1. Kerberos network identity authentication protocol

Kerberos is a kind of network identity authentication protocol, which mainly exists in the upper construction of TCP / IP communication protocol stack. Through DES encryption and authentication, we can provide authentication service for the C / S structure of external network transmission, as shown in Table 1. Through Kerberos, we can obtain the authorization of the network host, which is a way without identity authentication. Through Kerberos, we can read and modify the packets transmitted in the network. Through symmetric key management mechanism, Kerberos technology can authenticate network users, which will request authentication service from clients<sup>[2]</sup>. The Kerberos database is a mechanism that is responsible for adding and modifying key rules. However, the client, authentication server and encryption key data transmission control can realize the management of communication access and transmission.

**Table 1.** Kerberos network authentication protocol

Kerberos, http, SMTP
UDP, TCP
IP

### 2.2. SSL security socket layer protocol

SSL secure socket layer protocol is a secure transmission mechanism between network application layer and TCP / IP protocol, including SSL handshake protocol, SSL encryption protocol, SSL alarm protocol, SSL record protocol and other components, as shown in Table 2. SSL, TLS protocol is a kind of protocol existing in the transport layer of network communication. Among them, SSL handshake protocol is responsible for the authentication of network communication, which will encrypt and exchange the key of data transmission<sup>[3]</sup>. Data encryption process can be divided into client, SSL protocol and server. However, SSL encryption protocol is the protection protocol of encryption key and message transmission suite, which will be used for the protection between client and server. Finally, through SSL alarm protocol and SSL record protocol, we can send alarm messages,. If the error byte value of the alarm message is 1, this is a general data communication error. If the error byte value is 2, this is a fatal error.

**Table 2.** SSL security socket layer protocol

Application layer: http, FTP, SMTP
SSL handshake protocol, SSL encryption protocol, SSL alarm protocol
SSL Record Protocol
TCP
IP

### *2.3. HTTPS Secure Hypertext Transfer Protocol*

Security hypertext transfer protocol is a technology to encrypt the data in HTTP network, including HTTP communication encryption, client and server identity authentication. The network communication protocol of HTTPS is in the application layer, which is the way to communicate with TCP. But in the network, we usually have SSL, TLS and other protocols, which requires us to communicate with SSL protocol and TLS protocol respectively<sup>[4]</sup>. Then, we communicate with TCP through secure socket layer (SSL) interface to provide various services, such as user identification, data information exchange, etc. HTTPS hypertext transmission protocol will use asymmetric encryption algorithm and symmetric encryption algorithm to encrypt and decrypt data. Through authentication, we can detect the security and integrity of TLS / SSL protocol.

## **3. The role of security protocol in communication technology**

### *3.1. Improve the security of computer communication operation*

Security protocol can ensure the safe operation of computer communication, which will play a huge role and significance. Security protocol improves the security of communication network, which has made up for some security loopholes in communication technology. By solving potential security threats, security protocol can improve the security of computer communication<sup>[5]</sup>. Through the design and implementation of technical personnel, we can repeatedly verify network security from multiple dimensions, which will strengthen the network security performance of computer communication technology. Security protocol improves the security of computer communication.

### *3.2. Ensure the security of computer network*

With the rapid development of network, network attacks and hacker problems emerge in endlessly, which is also an important difficulty of network security technology. With the frequent network security accidents, we must develop and design more kinds of security protocol technology, such as security core system, VPN Security tunnel, identity authentication, network underlying data encryption, network intrusion active monitoring and so on. By increasing the network security, we will greatly increase the overall security of security technology. Secure network protocol can realize a complete security system, which will keep the traditional network protocol. Based on the core system of network password, we can support different types of security hardware products, which will realize a variety of security protocols. Security protocol guarantees the security of computer network.

### *3.3. Promote the efficient development of e-commerce*

E-commerce is booming, which has played a very important role in social economy. E-commerce is a financial behavior that trades on the Internet in the whole process, which is easy to cause security problems. Therefore, through the security protocol technology, we can promote the better realization of computer communication technology, which will improve the integrity, identifiability, confidentiality and unforgeability of e-commerce transactions<sup>[6]</sup>. Through security protocol, we can effectively improve the security performance of e-commerce system. In addition, the security protocol has a strong encryption guarantee, which will improve the ability of data identification and authentication. By storing and encrypting data, we can complete the confidentiality matters to the maximum extent, which creates a more secure operating environment for the economic development of e-commerce. Therefore, the security protocol promotes the sustainable development of China's social economy.

### *3.4. Enhance the application value of emerging industries*

Network communication has many characteristics, such as openness, efficiency, convenience and so on, which will attract more and more investors. Based on the guarantee of complete network, we can attract more people to invest in the emerging industries of network, such as e-commerce. After years of development, China's e-commerce mode is becoming more and more mature, which has become the leading mode of business activities. The openness of network leads to a dangerous situation of privacy information and data, which will be easily stolen. Therefore, we must guarantee the network security, which will effectively promote the development of e-commerce. Through the security protocol, we can get a more stable, safe and reliable operating environment, which will effectively prevent malicious attacks from hackers and viruses. By protecting the information and data security of businesses and individuals, we will improve the application value of emerging industries. Through advanced technology, we can ensure the security of computer communication technology, which will promote the development of network emerging industries such as e-commerce platform.

### *3.5. Control of design cost*

Security protocol can control the cost of design. Security protocol is the foundation of building network security environment, which is the key technology of building security network. By designing security protocol, we can ensure the security and correctness of network operation, which will avoid information leakage, such as network data information loss or file damage. In the application of computer network, security protocol can improve the security of network information transmission, which will have excellent stability. Therefore, we can control the design cost well. By predicting the difficulties and attacks faced by the protocol, we can complete the prevention ahead of time, which will reduce the design cost and later application cost. By ensuring the security, low cost and high performance of security protocol, we can ensure the security standard of network communication technology. Therefore, the security protocol controls the design cost.

## **4. Conclusion**

With the advent of network information, the reliability and security of computer information technology has gradually become the focus of attention. Security protocol has been gradually applied to computer communication technology and achieved good results. But in the practical application process also exposed some defects and deficiencies. Therefore, the relevant technical personnel continue to learn and summarize the experience and lessons, which will improve and perfect the existing security protocol. By ensuring computer networks, we can promote economic development and progress.

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