Research on Computer Network Information Security and Countermeasures Based on Internet of Things

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Abstract: At present, the extensive application of the Internet of Things has brought great convenience to people's production and life, and also brought great challenges to the information security of the Internet of Things. Therefore, it is imperative to study the information security technology of the Internet of Things. The application of Internet of Things in different fields not only helps to improve the work efficiency in various fields, but also brings challenges to the protection technology of computer network information security. The popularization of computer information networks has created new ways and means for information crimes. The theft of network information and the theft and reselling of personal network information have seriously affected the social security. Under the background of Internet of things, it is very urgent and important to strengthen the protection of computer network information and protect computer network information. Based on the analysis of the concept of Internet of things, this paper analyzes the influencing factors of computer network information security under the background of Internet of things, and further puts forward the Countermeasures of computer network information security under the background of Internet of things era.

1. Introduction

The penetration of the Internet of Things in various fields and industries creates a digital world through comprehensive perception, preservation and sharing of data. In this case, the way people look at the world and make industry decisions depends more on implementation data. With the rapid development of electronic information technology in China, the Internet of Things is increasingly affecting people's work and life. At the same time, there are network information security problems that endanger the entire Internet of Things and even the security of system operation [1]. If the information is disclosed and used by undesirable personnel, it is bound to bring serious losses to individuals, enterprises and the country. The widespread use of the Internet of Things in various industries not only helps to improve the work efficiency in various fields, but also brings challenges to the protection technology of computer network information security [2]. In the application of computer network technology, it is inevitable to generate all kinds of information, including not only the personal information of users, but also business information and important state secrets [3]. The Internet of Things has penetrated into almost all industries and fields in our life. The computer information network has created a digital new world through the collection, storage, sharing and calculation of the Internet of Things, which we cannot see but which affects us all the time [4]. In the context of the Internet of Things, it is of great significance to develop scientific and reasonable countermeasures against computer network information security and optimize the network environment.

A large amount of data information spreads rapidly in the network, so the requirements for information security are getting higher and higher. It is necessary to continuously improve the level of computer network security protection and establish a more efficient information protection system to meet the requirements for network information security in the context of the Internet of Things era [5]. With the continuous development of social economy and information technology, the Internet of Things, as a symbol of the information technology era, allows the current social development of this period to rely on the carrier of the Internet of Things to achieve faster and wider development [6]. Although there are many advantages in the era of the Internet of Things, it

also increases the risk of computer network information security. If a security problem occurs, it will not only cause distortion of information data, but also affect the effectiveness of human use of information [7]. The explosion of data has brought a new challenge to computer network information security. In the era of Internet of Things, China needs to attach great importance to the security of computer network information, and formulate a complete computer network information security management plan for the characteristics of Internet of Things and network information [8]. When dealing with the Internet of Things, it is necessary to rationally analyze the information advantages and disadvantages of the physical network period, and on the basis of exploring the development of the Internet of Things and computer communication network information, improve the service efficiency of the Internet of Things for social and economic development [9] . This paper further analyzes the influencing factors of computer network information security in the context of the Internet of Things, and further puts forward computer network information security protection strategies.

2. Factors Affecting Computer Network Security in the Context of Internet of Things

2.1. The influence of computer network technology itself

Computer networks are characterized by openness under a wide range of application requirements, which makes computer network systems vulnerable to external attacks and leads to a decrease in security. The Internet of Things can effectively perceive and identify the physical world through perception technology and intelligent devices. With the help of network transmission interconnection, calculation, data processing and knowledge mining are carried out to achieve seamless connection of information between people and objects, and between objects and objects, and to realize accurate control and management of the physical world. The Internet of Things can be extended to different fields and integrated into various industries, sensing data on the basis of sharing and exchanging data information, and making accurate prediction based on the obtained data, providing the main reference for industry decision-making. In the development of social communication network in the future, the Internet of Things is its basic constituent content. Everything involved in the Internet of Things has substantial characteristics. The system optimization of information network is completed by means of intelligent interfaces. In the Internet of Things era, it is of certain practical significance to strengthen the level of network information security, especially the importance of current information and data to production and life is gradually prominent, and the importance of strengthening computer network information security is especially important.

2.2. Improper operation of computer network information users

Users of computer network information lack the awareness of security protection, and negligence may cause the problem of disclosing users' security passwords or other security information during operation. This inappropriate operation mode is just created by the destruction of illegal elements. In the process of controlling the authority, it is necessary to correctly verify the user's access authority and prohibit irrelevant personnel from entering and applying information on the Internet. Under the background of the continuous development of the Internet, the market's demand and requirements for the Internet of Things are constantly increasing, which brings certain pressure to the network resources. In this case, it is necessary to take timely and effective measures to reduce the impact of the Internet of Things on market development. Various functions of the computer need to be executed under the user's operation, and the user's operation of the computer is often subjective. With the development of computer technology and the convenience it provides, computer technology is playing a more and more important role in all walks of life. Good operation is an important means of protecting computer network information security, and it is also an external help for the computer system to function.

3. Suggestions on Network Security Precautions in Internet of Things Era

The transmission layer of the Internet of Things is based on the communication network, with the help of broadband and other computer communication means, to achieve a high degree of integration between broadband and narrowband, communication network and perception network. With the wide application of the Internet of Things, with the emergence and popularization of new computer technologies, the factors affecting the security of computer network information are gradually becoming diversified. The new technology of computer network information generated under the background of the Internet of Things and the rapid and extensive use of computer networks have led to the diversification of factors affecting the information security of computer networks. The contents of data and information are diverse, mainly for communication, including pictures and videos, etc. At the same time, there are differences with traditional single data results. As the basic component of the Internet of Things, the sensing layer of the Internet of Things senses and collects specific data of different monitoring objects in the whole network coverage area, and transmits the data by means of the corresponding gateways of the network box. The network management can realize the connection between different networks. After the communication with the sensors is completed, the received information is analyzed and processed according to the algorithm [10]. When using the perception layer of the Internet of Things to implement information analysis and processing, there will be more flexible means to apply, and the efficiency of information processing will also be effectively improved, laying a solid foundation for the overall development and improvement of the computer network.

In order to implement the decision-making of the decision-making level, it is also necessary to have a management level that manages the daily work and an implementation and maintenance level that is responsible for implementing safety plans and decisions. This forms a hierarchical information security organization under the direct leadership of the chief information officer. the security organization includes an organizational decision-making layer, a management control layer and an execution and maintenance layer as shown in Figure 1.
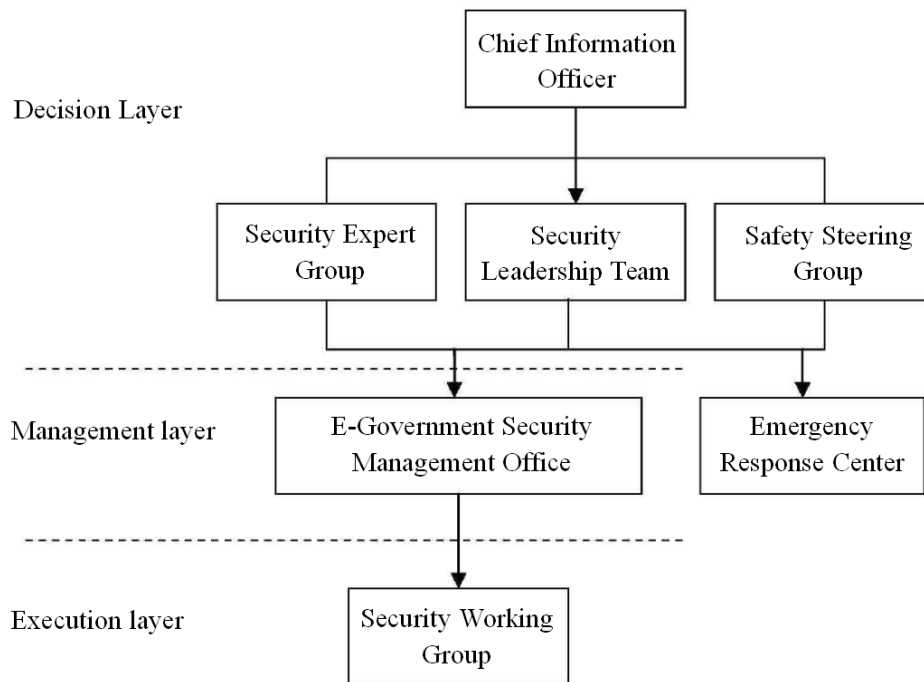

Figure 1 Hierarchical information security organization

The system security assessment should consider the security analysis of the existing system, mainly to check whether the target software has a known penetration change, and needs a simple, flexible and complete model. The shortest distance of mobile nodes, analyze the shortest distance between mobile nodes and the average distance of the network. As the social relationship of nodes

increases, the shortest path between nodes and the average distance of the entire network are decreasing, as shown in Figure 2.

Table 1 Analysis of mobile social network structure

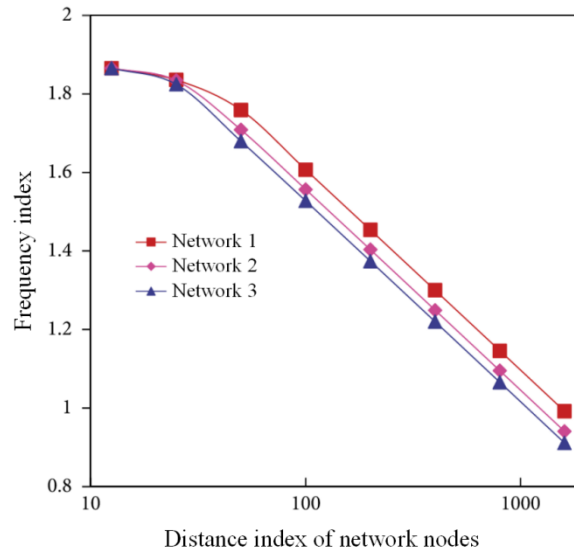| Network	Number of nodes	Number of relationships	Network density	Central potential
Encounter information	187	217	0.722	0.259
Interactive information	184	214	0.573	0.246
Weighted sum	178	215	0.578	0.238

Figure 2 Node distance analysis of mobile social network

Under the background of the Internet of Things era, the update rate of China's computer network technology is amazing, which brings difficulties to the security prevention and management of information data. During the development of computer communication network, through effective management of different nodes of the Internet of Things, the work efficiency of the Internet of Things is improved. The imperfect system is the root cause of the network information security problem. First, users lack of maintenance and repair of computer network systems, which results in the destruction of network information. An act of malicious destruction of network information, including active attacks and passive attacks. In the context of the Internet of Things era, in order to reduce the damage of malicious software and viruses to network information security, in addition to fundamentally improving the safety awareness of users, it is also necessary to strengthen the rational and effective use of security control systems such as firewalls. The business scale of the Internet of Things, as the main content to solve the problem of interaction with other communications, and the construction of an effective operating platform are the basis for further improving the computer information processing capability of the Internet of Things industry [11]. The current situation of hacker and virus invasion is getting worse and worse. In order to make up for this effectively, the most important thing is to strengthen the application of data encryption technology, and to resist hacker and virus invasion through more rigorous encryption and related prevention technologies. Some computer network users who are not professional have poor awareness of network security and weak operation technology. Under the background of rapid development of science and technology, the society is increasingly demanding the use of data information. In order to ensure the accuracy of data information, the processing and screening level of data information is also continuously improving. Users should strengthen their ability to distinguish hacker's stealing behavior, and reduce the probability of successful virus and hacker invasion by optimizing firewall level and distinguishing internal and external data. In order to effectively ensure the security of computer network information, special information security

protection mechanisms should be formulated to reflect the authority and persuasion of laws and ensure the security of computer network information.

4. Conclusion

In the context of the Internet of Things era, the issue of network information security is a topic of general concern to all sectors of society. However, there is a huge economic potential hidden in the context of the Internet of Things. The application of the Internet of Things should be premised on network security protection. As a new technology rising in the world, Internet of Things technology has obvious promotion value for economic and social development. It has very important practical value for the research and application of the Internet of Things. It is urgent to improve the level of network security. Only by enhancing the technical level and strengthening the relevant safety awareness can the potential network information leakage be effectively avoided. Although the development of Internet of things technology in China is still in the initial stage, there is not much experience and lessons learned, but we should be optimistic and positive attitude to deal with the rapid development of Internet of things, and provide development opportunities. Only by establishing and strengthening the network security technology and the complete network security system, can we have a place in the future data analysis era. Internet information security protection work is not done overnight, it is a systematic and long-term process, which requires the majority of staff to continuously solve the endless information security problems in the application process of the Internet of things, so as to achieve the improvement of the technology level of the Internet of things.

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