

## Analysis and Research on the Application of Network Technology in Colleges and Universities

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**Abstract:** Since entering the era of modern information technology, computers have been widely used, and colleges and universities, as the frontier for the construction and cultivation of computer science talents, have been widely used in computer networks. In their teaching, they have combined information technology, network technology and database technology. Integrate the resources of the entire university. The construction of the campus network has attracted everyone's attention. Under such circumstances, how to effectively manage the campus network to maintain its safe, stable, high-speed and robust operation is an effective support for college teaching, scientific research, and teacher-student information management. This is also the primary problem that campus network needs to solve at present.

### 1. Introduction

In recent years, due to the continuous development and improvement of the Internet, all sectors of society have realized the convenience brought by the Internet. Major universities have also begun to join the army of the construction of Internet information campus. This measure has also greatly improved the school's teaching resources, campus activities, and research management. In this campus network, it is possible to transfer and share school culture, research and construction, share teaching resources and achievements of teachers, and manage information of students and teachers. And because of the powerful function of the computer, the important role of the campus network can not be underestimated, and has contributed a lot to the school's information construction. Students can use the resources on the campus network for autonomous learning. Teachers can communicate and share teaching resource courseware through the Internet as a platform and understand the progress of world knowledge development. Various activities in the school can also be displayed on the campus information network. It plays an indispensable role in school culture and academic construction. However, the introduction of the Internet into the construction of universities is also risky. Many people can access the internet of colleges and universities. If some malicious people enter the campus network, they can easily tamper with the contents. In the previous examples, not only the campus information was stolen and used illegally, but also people introduced viruses into the campus network, which led to the loss or disclosure of teacher and student information, the plagiarism or deletion of student works and so on. This article will explain the establishment, operation, possible failures and maintenance of campus networks in universities.

### 2. Status of Computer Networks in College Campuses

#### 2.1 Campus Network Diversifies and Expands Student and Teacher Learning

Using the campus network, students can enhance their professional knowledge, broaden their horizons, and cultivate their self-learning ability. Teachers can use the campus network to diversify the teaching process and help students understand more cutting-edge knowledge.

Students can improve themselves through the database including excellent courses, electronic scientific journals, master's thesis databases, and e-books provided by the campus network. It is conducive to cultivate students' creative thinking and ability, and improve students' ability to solve problems independently in actual learning work.

## **2.2 Campus Computer Network Realizes Resource Sharing and Increases Learning Channels**

With the continuous development of the Internet, a global information network has been formed. All kinds of resources and information flow and share on the computer network. The network environment is colorful. It provides an excellent learning platform for people all over the world. Using the Internet, students can learn autonomously more effectively. Teachers and students can make full use of various learning software such as forums and open classes. The learning process of students extends from the classroom to the Internet. It not only strengthens students' understanding of classroom knowledge, but also strengthens their ability to innovate and develop. For college teachers, in order to adapt to networked teaching, "four meetings" must be achieved, including proficient in operating computers, teaching materials downloaded from databases, students management, and multimedia teaching methods. For students, they should improve their learning and practical abilities through the Internet.

## **2.3 Using the Internet to Improve the Development Level of the Discipline**

Computer science is a comprehensive subject that involves a wide range of knowledge, high technical requirements and strong practicality. Computer science is currently undergoing rapid development. As a large part of computer science, network technology benefits from the global development of the network. For network science, the actual application effect is very emphasized. Through practice, students can strengthen their learning ability and strengthen their understanding of classroom knowledge. At the same time, the campus computer network provides a more convenient platform for communication and improvement of various disciplines. It helps to improve the overall scientific research strength and teaching level of the school. Colleges and universities should make full use of the convenience of the network to drive the continuous development of related disciplines, and provide a wider development space for various types of talents.

## **3. The Current Status of Network Technology Needs in Universities**

Campus network construction is not only a simple hardware platform construction, but also an application system software platform construction. The function of the campus network is service. Campus network users include the entire school's students and all faculty and staff. In order to meet the needs of the modern teaching and management of the college, and to realize the modernization of education and improve the teaching level, the school needs to improve the efficiency of daily management of the school through a computer information management system. And it strengthens the sharing of resources within the college and with other colleges, and communication between schools and parents. To this end, the campus network should achieve the following goals.

(1) The computer network should realize the teaching management network, and complete the collection, processing, query, statistics and analysis of college teaching management information. At the same time, it is necessary to realize the office automation of each department of the college and improve the efficiency of college management. It needs to collect and organize various data such as college administration, personnel, finance, salary, teaching management, students, logistics, and provide necessary query and maintenance authority according to user needs. It needs a printable output if necessary.

(2) It is necessary to give play to the role of computers in teaching, to realize the network of multimedia courseware production, and to gradually realize the electronic and multimedia of teacher preparation.

(3) It is necessary to ensure the openness and sustainable development of the network system in teaching. It is convenient to integrate functions such as video-on-demand and distance learning in the future. It can also enable students to learn by themselves in the spare time.

(4) The network system must be safe and reliable, and ensure the safe operation of teaching data. And it can meet the needs of the college's continuous development and data update.

(5) The campus network uses the Internet to organize information on the network and establish an email service on the campus. At the same time, the campus network and the Internet are fully connected.

(6) It can access China Education and Research Network and the Internet. It also realizes real data sharing, resource sharing, information sharing

#### 4. Computer Network Security Issues

Nowadays, information technology is developing at a faster speed. All major universities have also introduced campus networks to manage student information. In addition, the establishment of the campus network also provides a platform for teaching exchanges for all teachers. From this aspect, the advantages of the campus network are many. However, from another aspect, due to the openness of the campus network, the information on the campus network becomes less private, which can be easily tampered or stolen by personnel. This will cause more or less violations of school information. Therefore, it is imminent to focus on the security of computer networks during operation. According to reports, there were more than 10,000 new viruses in 2015. A virus-infected computer can happen three times in about a minute. Viruses are not only the only enemy of Internet security problems which also include spy plug-ins, ad implants, and phishing software. They all attack the Internet. Among them, the most harmful is the spy plugin. It has become the number one threat to Internet security. The opinion of related technical personnel is that the emergence of spy plugins is very fast now, and this phenomenon will continue for a long time in the future.

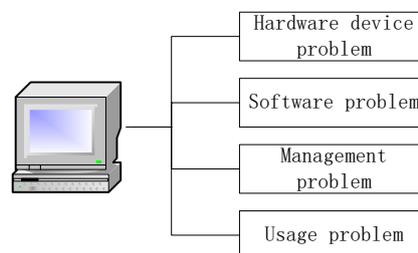


Fig.1 Computer Network Security Issues

##### 4.1 Defects in Hardware Equipment

(1) There are design loopholes in the development of network components. The current network protocol starts with an environment in which a network system can operate safely. Generally speaking, there are certain errors in the design of both network communication systems and application system protocols. These mistakes are just a convenience for cyber attacks. For example, router port vulnerabilities are one of the most serious problems.

(2) Electromagnetic leakage. In the line used by the Internet, electromagnetic leakage occurred in computer processing equipment. At present, universities in our country are relatively weak in preventing electromagnetic leakage. Therefore, there is a danger that information may be damaged in the information transmission route of the Internet.

(3) Illegal terminal. When the user is disconnected from the network, another illegal end user will access the network and control the Internet system. In this way, the information in the computer can be easily modified or even stolen.

##### 4.2 Insecurity of Internet Software in Universities

(1) Internet illegal intrusion. For criminals with high professional ability, they can easily crack

the password, and can be undetected, sneak into the Internet system, and then attack.

(2)Trojan technology. Some criminals attacked computer systems by means of their own invention. The Trojan technology is a computer virus that is not easily found by computer operation managers. Therefore, the concealment is very good, so it has also become a common means for criminals.

(3)Computer virus. An artificially designed destructive program is inserted into the normal program of the computer, so that the computer system can lose its original function. Computer viruses can also back up the original information encoding in the computer.

(4)Scan ports. Scanning the network ports can easily obtain the most important information in the Internet. It is possible to estimate how many ports are in the most important system in the Internet, and the numbers of each port can be easily obtained. With the above conditions, you can accurately determine how the major Internet systems operate and how they operate.

(5)Attacks Internet protocols such as TCP / IP. TCP / IP is a communication protocol for computers connected to the Internet to communicate, and it is a transmission control protocol / Internet protocol. It defines standards for how electronic devices connect to the Internet and how data is transferred between them. It is the basic communication language or protocol in the Internet. But TCP / IP is vulnerable.

(6)Email spread virus. Many of the most common computer viruses and other malware spread through email attachments. If the file attached to the email contains a virus, the virus usually starts when the file attachment is opened.

(7)Software defect. It is a problem, error, or hidden functional defect in the computer software or program that undermines normal operation. The existence of defects will cause the software products to meet the needs of users to some extent.

### **4.3 Lack of Internet Management**

It contains the following points: there is no special computer network security defense system, too few professionals specialize in maintaining Internet security, the confidentiality of those who operate the Internet is poor, poor work efficiency, there is no special classification for documents, internet supervisors' own problems.

### **4.4 Insecurity of Internet Users**

At this stage, the users of the campus network are mainly college students. Students' awareness of Internet security is often poor. It's just that computer science students have some knowledge of the security of the Internet. Students in other majors don't care much. In their opinion, maintaining the security of the Internet should be the responsibility of specialized technical personnel. This has become one of the factors of Internet insecurity. In fact, the campus network's own system can be easily attacked. The measures taken by Internet supervisors when dealing with external attacks cannot be flexibly changed and cannot effectively suppress the attacks. Even the threat of the Internet cannot be detected in time. This creates a vicious circle of poor Internet security.

## **5. Computer Network Construction Strategy in College Campus**

With the advent of the networked era, the exchange of various types of information on the network is open and virtual. This allows students to get more information and resources online, and the field of activities is greatly expanded. For all kinds of information, the students' own discrimination ability has been greatly challenged.

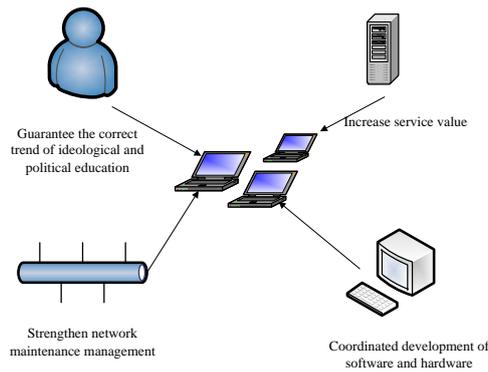


Fig.2 Four Aspects of Computer Network Construction

### 5.1 Guarantee the Correct Trend of Ideological and Political Education

Through the campus network, it provides a closer relationship between ideological and political educators and students. Utilizing the network platform can build a modern website for students' ideological and political construction, and seize the Internet position of ideological and political teaching. Therefore, it can help students establish a correct outlook on life and world, and guide students' healthy development of thought. At the same time, the use of the network can continuously strengthen the ability to supervise BBS and other services on campus. Students' ideological trends can be comprehensively grasped and actively guide students' healthy communication.

### 5.2 Increase Service Value

The sharing of teaching resources is the focus of colleges and universities in building campus networks. Colleges and universities should not only strengthen the ability to share various types of resources, but also improve the significance of colleges and universities in the construction of teaching and sharing capabilities, and promote the simultaneous construction of all aspects. Today, some colleges and universities have established interconnected resource sharing platforms through the campus network. However, the actual use situation is not satisfactory. The various types of network resources and services that universities spend heavily on purchases are not fully utilized. Information sharing on campus is hindered and it is difficult to play the role of campus network. Therefore, the construction of campus networks in universities should focus on improving the utilization of teaching resources. It can help students obtain the information they need from the campus network and make full use of the Internet's service functions.

### 5.3 Strengthen Network Maintenance Management

In the construction of campus networks, security issues are the focus of university management. The establishment of an efficient and smooth campus network is the focus of college network construction. To achieve this, it is essential for the daily maintenance and management of the campus network. For example, universities should strengthen information maintenance. For the campus network, it is necessary to face various users with different permissions. This has caused a lot of unnecessary confusion in the use of campus networks. Only by strengthening the maintenance of information can we ensure the smoothness of the campus network during use. In addition, once the campus network is connected to the Internet, network security issues have become the focus of university network management. Therefore, the management of network security must be enhanced in the construction of university campus networks. Improve the security of the campus network by setting up professional security administrators and installing firewalls. In the construction of campus networks, universities should also strengthen the construction of network platforms to provide scientific and reasonable network environments for users on campus.

## 5.4 Coordinated Development of Software and Hardware

The construction of campus computer network requires the cooperation of software and hardware. This is a huge systematic project. Colleges and universities should construct network construction projects that are in line with actual conditions according to their own circumstances,. On the one hand, software, as the driving force for the development of computer networks in college campuses, is of great significance for improving the construction of college networks. The construction of modern teaching platforms, the use of network databases and the construction of electronic libraries are inseparable from advanced software. On the other hand, hardware facilities are the foundation of university network construction and the basic project of network construction. Only by adhering to the combination of software and hardware in the network construction can the campus network really play its role.

## 6. Conclusion

Internet security is now an important factor affecting the development of the Internet. On the one hand, it can maintain the stable operation of the Internet system. On the other hand, it also helps to promote China's informatization construction. Modern computer network technology has also become an integral part in all aspects. Whether it is teachers, students, or office workers, the Internet is everywhere. Therefore, ensuring the security of the Internet has become a problem that must be solved now.

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