Analysis on 4G Mobile Communication Development Trend and Security Enhancement Strategy

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Abstract

With the continuous progress of science and technology, 4G mobile communication technology began to gradually replace the status of 3G. The fourth generation mobile communication technology is not limited by time and region which can build a wireless network platform in any place and provide smooth network services. With the development of new mobile communication, 3G mobile communication cannot meet the needs of the community at this stage, thus the majority of developers have begun to explore and research 4G mobile communication system. The fourth generation mobile communication technology can not only provide a smooth Internet access environment, but also can carry out data tracking and positioning, data acquisition, remote control. In this paper, we analyze the development trend of 4G mobile communication, and put forward the security enhancement strategies.

Keywords: Mobile Communication, Development Trend, Security Enhancement Strategy, 4G, Analysis.

Introduction

From the late 1970s, the United States AT&T company developed the first set of cellular mobile communication system, since then mobile communication technology has been rapidly developed. Mobile communications technology bring the world a huge change, it can be said that is a revolutionary change. As more consumers begin to use 4G mobile communication technology, the fierce competition of mobile communication market in the field of 4G mobile communication technology is also increasing.

Mobile communication technology has been developing for many years, reflecting the ultra-high speed of information development. Therefore, in the mobile communication technology updates and upgrades, we have to analyze the advantages and disadvantages of the existing technology, and predict the development of improved models. 4G opens a new era of mobile communications technology, and also led the trend of information upgrades.

4G mobile communication technology in the communication industry generally refers to the fourth generation mobile communication technology, because of the different research and practice in the industries, the concept of 4G mobile communication technology is difficult to be unified. 4G mobile communication system is the combination of 3G technology and WLAN, which can fast transmit high quality video and images, and the quality of the video image is no less than high definition TV. At the same time, 4G mobile communication system provides more convenient services, so that people can connect to the wireless network in any place.

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4G mobile communication technology in the future will realize the freedom of communication between people in the true sense, and bring a great change to the society. At present, 4G mobile communication technology has the following characteristics:

- Faster communication speed.
- Wider network spectrum.
- More flexible means of communication.
- More good technical foundation.
- Better compatibility.
- Acceptable price.

At present, it is widely acknowledged that 4G mobile communication system has great potential for development in the future. However, there are still many problems in 4G mobile communication system:

- There is no uniform standard for the world communication system.
- The capacity of 4G mobile communication system needs to be further expanded.
- The update speed of the network infrastructure is not guaranteed.

![Figure 1. The development of mobile communication technology.](image)

**The Proposed Methodology**

**4G Mobile Communication Technology.** According to the analysis of 4G mobile communication technology, in theory, 4G mobile communication technology can reach 50 times the rate of 3G mobile communication. 4G mobile communication technology has a high degree of intelligence whose structure is more reasonable, such as terminal, interface, operation, and services. In addition, 4G mobile communication technology has a better compatibility which helps the effective transmission of information, and is conducive to the achievement of ultra media communication goals.

- Orthogonal frequency division multiplexing: OFDM converts high speed data signals into parallel low speed sub data streams. In 4G mobile communication technology, OFDM structure has the advantages of high spectrum efficiency, strong anti fading capability, high speed data transmission, which is the core component of 4G mobile communication technology.
• Smart antenna technology: SA technology can suppress the signal interference, automatic tracking and other functions, which is the key technology of 4G mobile communication technology.

• Software radio technology: The software radio is the micro electronics technology of 4G mobile communication technology, which uses the open platform.

• IPv6: IPv6 has a huge network address, which can provide a unique address for all users of the communication network.

The Main Development Trend of 4G Mobile Communication Technology. 4G mobile communication technology has brought many opportunities to the entire communication industries, and also brings a deep level of competition.

Communications companies should recognize the trends of market and technology development, and improve the security of mobile communications, transmission speed, and provide intelligent services.

• Interference suppression technique: 4G mobile communication technology is facing more and more serious electromagnetic interference, thus the premise of 4G technology advantage is the development of new interference suppression technology. At present, the interactive interference suppression technology is classified as the core technology of anti interference. The future development of 4G mobile communication technology is to enhance the ability to resist electromagnetic interference, in order to protect the stability of the communication signals.

• Recognition technology: Nowadays, more and more people are using 4G mobile phones, so the researchers need to open up the multi user identification technology to realize the intelligent and humanized communication technology. In order to increase the capacity of the whole system, more mobile communication base stations need to be built up.

• Receiving technology: Energy saving and environmental protection is an important prerequisite to promotion of 4G mobile communication technology. On the basis of 3G, 4G mobile communication technology requires low energy consumption of the receiving technology by using a miniature radio receiver to improve the stability and reduce the energy consumption of the communication.
• Wireless access network technology: Under the background of the mobile communication network technology development, researchers need to develop access technology with large capacity, high speed, low cost and wide range, and theoretical structure and network framework based on IP technology should be established.

![Diagram of 4G network transmission process](image)

Figure 3. The transmission process of 4G network data.

**Problems Faced By 4G Network.** With the development of science and technology, the use of 4G network greatly improves people's office efficiency, and also promotes the development of social economy. Nevertheless, there are still some problems in 4G network, which is a stumbling block for the rapid development of mobile communication technology.

• Network security problem. 4G network security problem is the biggest obstacle in the development of 4G mobile communication technology. This is mainly due to the current 4G network is still not able to make a seamless connection, result in data loss and delay during the process of 4G data transmission. At the same time, the optimization of 4G network is low. Hackers can steal personal information of 4G users, which brings a great security risk.

• Network promotion problem. At present, the infrastructure of 4G network is built on the original 3G network facilities, therefore the 4G network infrastructure will be influenced by funding, technology, and transformative process. In some regions, 4G network infrastructure has not been successfully built up, result in promotion problems.

• 4G network speed problem. Due to the existence of different network standards, many operators do not form a unified standard speed. Although the 4G mobile communication technology is developing rapidly, the network speed does not catch up to the requirements.

**Some Optimization Strategies:**

• Construct a 4G network security system. In order to further develop the 4G mobile communication technology, we need to constantly build and improve the 4G network security system. Real name authentication, the implementation of monitoring and control can ensure the legitimacy and security of 4G network.

• Strengthen the network firewall settings. Network firewall refers to the application of network hardware equipment and the connection between the networks, which is used to
filter and scan all network communication content. Firewall can effectively protect the 4G network users in the process of using the network from viruses, Trojans or hacker attacks.

- Strengthen related Internet and new network technology. The Internet has developed for decades, its network security technology research is better than 4G network, which offers good protection for users. Therefore, 4G network can enhance the relevance of the Internet, drawing on the advanced technology of the Internet Network Security.

- Strengthen the construction of 4G network infrastructure and publicity of public relations. Strong hardware support is the basis for the rapid development of 4G network, so 4G network enterprises should be based on the optimization of 4G network technology, and strengthen the construction of 4G network infrastructure. In the process of 4G network promotion, enterprises should not only enhance the 4G network infrastructure and technical support, but also should strengthen the publicity of public relations. Only in this way can we ensure the smooth development of 4G network promotion.

The construction of 4G network has a great promotion to the development of the whole social network information system, mobile communication system and society. Although the current 4G network still has many problems, such as network security and promotion, etc., with the development of technology and economy, these problems can be solved in the future.

Conclusion

Mobile communication technology has been developing for many years, reflecting the ultra-high speed of information development. With the continuous progress of science and technology, 4G mobile communication technology which is not limited by time and region began to gradually replace the status of 3G. As more consumers begin to use 4G mobile communication technology, the fierce competition of mobile communication market in the field of 4G mobile communication technology is also increasing. In this paper, we analyze the development trend of 4G mobile communication, and introduce several problems faced by 4G network, at last, we also put forward some security enhancement strategies. 4G mobile communication is kind of new generation of communication technology in the process of the development of communication technology in the new era, which promotes the revolution of mobile communication technology, and it also brings a better user experience for consumers. Compared with the mobile communication technology in the past, 4G has brought a profound change to people's life, so that people can get information more quickly. At the same time, 4G mobile communication technology promotes the global information process, and connects the whole world together.

References


