

# Discussion on the application of 5G communication technology in the Internet of Things

Zhiqiang Wang \*

Beijing C&W ELECTRONICS(GROUP)CO.,LTD, Executive Vice President, Research

Research Fields:computer application technology

\*abc-2535@126.com

## Abstract

*At present, the Internet of Things has been widely used in various fields of people's work and life. At the same time, 5G communication technology has been widely concerned in various fields, which makes the network technology is constantly adopted and optimized. 5G communication technology has the advantages of high capacity, fast speed and low latency. The technology has played an important role in promoting the development of the Internet of Things. This paper focuses on the relationship between 5G communication and the Internet of Things, as well as the convenience brought by the combination of 5G communication and the Internet of Things technology for people's life and production.*

## Keywords

*Internet of Things; 5G communication technology.*

The application of wireless communication technology has changed people's traditional way of life. People can entertain, study and shop online, which provides people with a lot of convenience. With the advent of the 5G era, wireless communication technology has an increasing impact on people's lives. With the development of communication technology, the level of information technology is rapidly improving. The Internet of Things is the product of the integration of information technology and communication technology. On the Internet of Things, various devices that people come into contact with in their lives are interconnected and connected through networks. The Internet of Things technology is conducive to the rapid application of 5G communication technology, and will also promote the intelligent development of Internet of Things technology. Therefore, it is necessary to analyze the application of 5G communication technology in the Internet of Things.

## 1. Overview of 5G communication technology

5G communication technology is the fifth generation communication technology based on 4G communication technology. As a new communication technology, 5G has greater advantages than the previous generation of communication technology. First, 5G communication technology is more stable, and the data rate, latency issues and system capacity have been significantly improved. Second, 5G technology can greatly reduce the cost and improve the corresponding control performance. With 5G technology, China's industrial, medical, transportation and gaming industries will see faster development. In addition, 5G communication technology can make full use of the advantages of the Internet of Things and realize the connection of iot devices and networks, thus realizing the rapid development of iot technology.

## 2. The impact of 5G communication technology on the development of the Internet of Things

## **2.1. The high-speed advantage of 5G communication technology has driven the rapid development of the Internet of Things**

With the development of Internet of Things technology, more and more data and information need to be processed. Traditional communication technology has been unable to meet the needs of the development of the Internet of Things, and there are also problems such as insufficient communication, network congestion and delay, and untimely information transmission, so the development of the Internet of Things has been hindered to a certain extent. However, the emergence of 5G communication technology effectively solves problems such as slow communication and high latency. Therefore, the full application of 5G technology in the Internet of Things can promote its rapid development. With the development of information technology and the increasing demand for networks, 5G communication technology is able to disseminate information more quickly and play a greater role in many fields. Therefore, the integration of 5G communication technology and the Internet of Things is the future trend, so 5G technology is an important cornerstone of the development of the Internet of Things.

## **2.2. Security of 5G communication technology promotes the development of the Internet of Things**

The Internet of Things (iot) technology connects all aspects of people's life, work and study and covers all aspects of people's lives. Cyber security is the basic guarantee for the normal operation of the Internet of Things, so it is getting more and more attention. 5G communication technology based on 4G communication technology strengthens the security mechanism of wireless communication information and improves the security of communication technology. At the same time, 5G communication technology can establish various security mechanisms, such as building monitoring and high-speed monitoring. In addition, in 5G communication technology, the improvement of antenna transmission technology can reduce the size of the terminal module and expand the coverage of the terminal module, so as to fully ensure the safe operation of the Internet of Things.

## **2.3. The convenient advantages of 5G communication technology optimize the development pattern of the Internet of Things**

5G communication technology has practical advantages. With the development and spread of communication technology, 5G technology has enabled more and more intelligent electronic devices to be developed and used, providing a good platform for the development of the Internet of Things, and optimizing the development structure of the Internet of Things to a certain extent. With the popularization of 5G communication technology, communication equipment will be more portable and able to use Internet technology anytime and anywhere, which greatly facilitates people's work and life.

## **3. The application points of 5G communication technology**

In the Internet of Things, network equipment, separation and transmission can be controlled to make system protocols and engineering applications more accurate and meet relevant requirements. 5G communication technology solves the specific problem of transmission equipment according to the equipment situation, and solves the problem of fine management in the chain according to the relevant protocol requirements of the internet. The network design allows for centralized management of the entire network, continuous distribution of IP device management points, and efficient centralized device management. Planning, controlling and managing the integrated network structure through 5G technology and virtualizing network functions through software programming are important for the entire

system.

Virtualization technology enables users to configure the right hardware, software and communication equipment, expand the network, continuously enhance the overall function, and significantly improve work efficiency. The Internet of Things and 5G communication are closely related to high-frequency transmission technology, and network capacity and data volume are constantly increasing. Communication technology can meet the needs of the development of IoT. With the development of 5G networks, communication technology can meet the needs of Internet transmission objects, increase network capacity and speed up integration. The rapid development of communication technology has created favorable conditions for the establishment of target networks. For example, the overall transmission speed can be improved with millimeter wave communications, thus enriching the spectrum. With the increase in the number of mobile platforms, to meet the needs of network development, the data transmission speed on the internet will be accelerated, and the overall data transmission speed will be improved. For example, expand the external design, improve the system capacity and work efficiency, and improve the stability and flexibility of the system. Dense network systems develop rapidly in the final stage and play a very important role in the development of the entire network.

#### **4. 5G communication technology application in the situation of the Internet of Things**

##### **4.1. 5G intelligent applications**

In the context of the development of the Internet of Things, the use of 5G communication technology can more effectively meet the development needs of the Internet of Things. To provide reliable intelligent operation standards. Today, economic development is accelerating, and the production mode puts higher requirements on science and technology. Therefore, we must devote ourselves to improving productivity. As production and life become more intelligent and the demands on networks continue to increase, the use of communication technologies will help spread networks quickly and efficiently and contribute to the development and change of socio-economic conditions. In the 5G era, the operation of networks needs to be continuously optimized and enriched. Designers need to analyze from multiple angles to ensure the smooth development of 5G technology and improve the service level of 5G technology through process incentives.

In smart enterprises, the Internet of Things needs more network technology. In People's Daily lives and production processes, AI services can be provided through 5G communication technology, reducing the consumption of human and material resources and simplifying the allocation of resources. In 5G communication technology, network technology provides an effective connection between different levels, so that network signals can be easily covered without waiting for a long time to avoid resource waste. 5G meets the production needs of the new era, enabling more work schemes to be used and increasing production capacity. In smart life, driverless and remote space control technologies based on 5G communication technology are widely used in the Internet of Things, which can reduce time and space constraints in various fields. In backward areas where production resources are relatively insufficient, 5G technology can be chosen for connectivity. At present, people are pursuing a high quality of life, and consumers who want a smart life can achieve it through the network. For example, in the medical action, the delay of the action image may lead to medical malpractice, so it is said that the improvement of the signal level provides a better guarantee for medical

development. The development of communication and Internet technology to some extent ensures the exchange of resources and information, which is of great value, while the

application of modern communication is increasing, and the needs of users, productivity and operation modes are adjusted throughout the process.

#### **4.2. Application of virtual network technology**

Whether the 5G communication network is defined by software or the virtual network function is directly defined, it is the basic technology of 5G communication technology. Virtual network technology is optimized for network management and management to improve security and control capabilities. The current use of automation technology depends on the support for virtual network technology. At the same time, software programming can effectively adjust the functions of the automation system, reduce part of the development cost, and improve the efficiency and accuracy of the Internet automatic control system. The real value of virtual network technology lies in the creation of management models on the network. These constitute a good architecture that can be adapted to communication systems and networks. There are a variety of industries related to the Internet, and the needs of communication systems and networks for devices in different industries vary greatly. Offline configuration using virtual networking technology can provide practical added value. The implementation of intelligent automatic object internet control greatly improves the efficiency of data and device interaction, the accuracy of data transmission and control command execution, and the security of intelligent automation system.

#### **4.3. The application of direct communication technology**

With the rapid development of communication networks, the existing mobile communication technology has been unable to meet the needs of the network, in fact, more and more useless. In addition, in the process of network signal transmission, the network signal is mainly sent through the base station, therefore, to receive the network signal first need to establish the base station, the information can not be transmitted outside the coverage of the base station, which to a certain extent hinder the development and dissemination of the network, users often report the mobile phone signal weak or no signal and other problems, which makes the communication between the user and the outside world becomes difficult. Thus affecting the normal production and life. The application of 5G technology can effectively solve this problem. 5G communication technology utilizes servers and devices to provide communication and information transmission, so even in areas without base stations, it can effectively change the situation of weak signal of base stations in the past, thus providing network connectivity. In addition, 5G communication technology not only optimizes network communication, but also greatly improves the speed of information transmission, enabling network users to enjoy a richer and better communication experience. For example, 5G technology can be used for autonomous driving, which has greatly changed the way people live in the early days. In particular, the adoption of direct communication technology can improve the stability of the network, thus preventing signal fluctuations when running large amounts of data. In fact, technology can facilitate the development of high-quality, efficient network businesses.

#### **4.4. Intensive network technology application**

With the continuous development of scientific and technological information and the progress of society, modern people's life and work need to put forward higher

requirements for the Internet of Things. In recent years, many users' responses to iot related applications show that at this stage, mobile communication cannot meet the specific requirements of all users, which may be caused by network failures and unstable network operation. Due to the high volume of data, users face the risk of network transmission interruption in network applications. After the interruption, users are unable to use the

network, which affects their experience to a large extent. With the arrival of 5G communication technology, transmission rates and network quality have undergone qualitative changes. In addition, the stability of network signals has been improved, and the flow of data has increased greatly. This has promoted the development of 5G communication technology to a certain extent, providing people with quality services. The combination of wireless hardware, Internet of Things technology and 5G communication technology requires a higher amount of data, fully reflecting the characteristics of dense network technology.

#### **4.5. The application of SDN/NFV technology**

SDN technology defines NFV as the virtual function of software network. In 5G communication, these two technologies are the main components, and it is necessary to speed up the research and development of some technologies, especially those related to triple play and cloud computing, which improve the security of 5G communication technology. In this regard, the existing mobile communication technology has been unable to meet the needs of active applications, and a large amount of network traffic will lose system control in a short period of time, in order to more effectively and reliably apply 5G communication technology to the development of the Internet of Things. The management mode and operating system of the existing communication network will be further simplified to effectively reduce manual operations, save human resources, and optimize operating procedures using 5G communication technology. Industries in all fields should attach importance to the application of NFV technology and SDN technology in the application of 5G communication technology, and promote the further application of 5G communication technology in the development of the Internet of Things according to the actual situation and basic needs.

#### **4.6. Application of high frequency band transmission technology**

The emergence of 5G communication technology has largely promoted the development of the Internet of Things, especially the use of high-frequency data communication technology within the scope of the Internet of Things. At present, with the rapid development of the Internet of Things industry, the Internet of Things technology is widely used in many departments and fields. The application of IoT technology requires information transmission and support network capabilities, and the mobile communication technology used in the past can only meet the simple needs of IoT networks. However, if a large number of Internet activities are organized, the existing mobile communication technology can not meet the requirements of the active application, and the system will crash in a short time due to the influence of a large number of network traffic.

High-frequency transmission technology mainly refers to the broadband

transmission speed can reach more than 10 times the microwave bandwidth. In other words, microwaves look very similar, but each one has a different radio frequency, sometimes completely different, millimeter wave frequencies usually stay between 30 and 300 GHz, with unique models and smaller sizes. Therefore, devices

developed on this basis can also be biased towards small size, low energy consumption and miniaturization. Millimeter wave can realize high-speed communication at short distances, and promote the integration of 5G technology with the Internet of objects, maintaining the high-quality development of the network. Through broadband data communication technology, network activities can significantly improve the efficiency and speed of information transmission. Millimeter wave not only improves the frequency bandwidth, but also improves the stability and reliability of the network, as well as the high-speed transmission effect and anti-interference.

#### **4.7. Practical application of 5G technology in smart cities**

#### 4.7.1 Smart home Application

Smart houses are an important part of urban construction. Usually, smart homes control home devices through the Internet of Things. However, due to the relatively low efficiency of the existing home system, there are some problems in control and detection. However, the use of 5G technology can make up for the lack of home intelligent construction, and further improve the reliability and security of smart home systems through rapid transmission of 5G technology and improved information collection and management.

#### 4.7.2 The application of 5G technology in urban transportation

In the construction of intelligent transportation, it is necessary to incorporate all means of transportation into relevant network services and make full use of various functions of various means of transportation, so that communication and transportation can be linked and developed with each other, interacting within the existing transportation network and formulating more automated and socialized management schemes. 5G technology will be used to monitor parking lots in real time. By observing parking time and vehicle load, relevant models can be summarized according to the actual parking situation, and a more scientific and intelligent vehicle management system can be established.

### 5. Integration of the Internet of Things and 5G network technology

At present, 5G communication technology is mainly the innovation and improvement of 4G communication technology, network quality and data transmission speed have been significantly improved, and data transmission has become more stable and secure. At present, the Internet of Things has become a priority for all industries, showing good prospects for development. Among them, the use of the Internet of Things will directly promote the development of communication networks. In order to accelerate the development of the Internet of Things technology, it is necessary to continuously improve the communication technology and improve the reliability and security of the communication network.

At present, 5G communication technology still has some problems that have not been solved. During this period, we need to continuously improve the network system and establish a comprehensive connection between the perfect mobile network system and 5G communication technology. Make full use of the advantages of these two technologies to improve the efficiency of network connection and reduce the cost of Ethernet construction. In addition, when building the Internet of Things, it is necessary to correctly connect network communication and information data to fully demonstrate the advantages and value of 5G communication technology and the rapid development of the Internet of Things. In the more advanced stage of development, the integration of the two technologies

is to provide people with a more convenient way of life.

### Conclusion

5G communication technology has replaced the old communication technology and provided more convenient services for economic development, production and life. In the development mode, 5G communication technology can better adapt to the reality of network development, and its development speed is faster and more stable. In the era of big data, information is the core element of productivity development. Information and communication technologies help plan and manage economic development more accurately. 5G technology will be integrated into the Internet development model, thus promoting better development of communication technology. And advanced electronic technology can more comprehensively monitor information transmission and network management, which contributes to rapid economic

development. 5G technology can comprehensively improve work efficiency and realize the three-dimensional development of communication technology.

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