Security Application of 5G Technology in Industrial Internet

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Abstract: The application of internet in the industrial field has become an inevitable trend in modern society. In the actual operation, there are possible safety risks. To ensure the system's proper operation, technicians are required to resolve the issues. In this context, the author thoroughly integrated with the present industrial development situation, examined the use of 5G technology in industrial internet security, and desired to leverage the advantageous benefits of 5G technology to boost industrial development. Due to the numerous benefits of 5G technology in security applications, we conducted an in-depth investigation and described it from the perspectives of relevant concepts, security, and security application guarantee measures, with the goal of achieving the goal of safe industrial internet operation.

Keywords: 5G technology; Industrial internet; Safety; Application measures

1. Introduction

The rapid development of communication technology, which has pushed the application of 5G technology to the forefront of society and is increasingly replacing 4G communication technology, has resulted in an indissoluble tie between China's diverse areas and information technology. In reality, the benefits of 5G technology in several industries exceed the downsides, therefore researchers are expanding research and development of this technology, and various fields are also attempting to integrate or improve 5G technology in order to fully use the technology's capabilities. The combination of 5G technology and this industry is even more inevitable from the perspective of industrial development. Relevant personnel should improve safety management and gradually enhance the use of this technology to ensure not only that the speed of industrial development does not stall, but also that the whole industrial field develops.

2. 5G technology and industrial internet

In the modern era, 5G technology is also known as the fifth-generation mobile communication network. It is not only important for national economic development and cultural success, but it is also one of the future trends in information technology development. The use of this technology in a variety of sectors can help to eliminate data transmission problems and irrational system planning. Furthermore, the use of 5G technology may enhance wireless transmission and network efficiency to the fullest extent possible, as well as fix problems in the industrial internet quickly and without disrupting work flow.

3. Security analysis of 5G application in industrial internet

3.1. Equipment

Sensors, instruments, and radio frequency identification, as well as other devices, are all used in the operation of the industrial internet. In comparison to typical industrial equipment, industrial internet terminal equipment has intelligent characteristics, and certain equipment can recognize different operating states and perform logical operations. The networked operation of industrial equipment is more comfortable, and equipment networking has grown more versatile, thanks to the present 5G backdrop. With the "intelligence and flattening" growth trend, the 5G technology of the industrial Internet should perform a good job in access authentication management in the future to prevent network intrusion in advance [1].

3.2. Data aspect

Due to the incredible pace with which information technology is developing, the data created will increasingly transition from a limited amount of single data to a large number of multi-dimensional data information. At the same time, essential data information will flow in both directions, within and outside the plant, between the Information Technology (IT) layer and the Operational Technology (OT) layer. In the industrial field, business applications are more sophisticated, data kinds and protection needs are more diverse, and data flow direction and course are more complicated. Not only does the network need to be reliable and fast, but the complexity of protecting industrial data and users will also rise dramatically. Based on the current 5G environment, internet applications in the industrial field can minimize data transmission delays by placing MEC nodes at the factory's edge, therefore enhancing the security of internet data. As MEC nodes are located near the factory's edge deployment, the capital investment in protection capacity is smaller than in traditional computer room protection, posing a danger to data security and increasing risk. Furthermore, network slicing may be utilized to provide data isolation in the present 5G environment, which will improve the security of various forms of data information, and slicing security will have a big influence on data security [2].

4. Security application guarantee measures of 5G in industrial internet

4.1. Clarify application requirements

Before applying 5G technology to internet security management in the industrial field, relevant personnel must be able to comprehend the industrial field's development and security demands, and plan work around what they've learnt. When the industrial internet's security requirements are demonstrated, they may improve the internet's security management efficiency and control relevant operations. There are various needs for industrial internet security in the new era, which are most commonly expressed in the building of cloud or service-oriented infrastructure, security context management solutions, and security anchor separation. At this time, internet security management must be carried out in accordance with the appropriate regulations. Relevant employees must examine diverse security demands and optimize various measures under various situations to guarantee that internet security needs in the industrial field are more acceptable, and that industrial internet security management is stronger.

4.2. Organizational safety framework

Before conducting internet security management, relevant personnel of the enterprise need to consider the actual operation of 5G technology, do a good job in the security architecture of the industrial internet in advance, play a systematic role, better apply the industrial internet, carry out security work, summarize the problems in the practical application of the industrial internet and solve the problems as soon as possible, so that the security of industrial internet can be controlled. In order to further improve the level of internet security architecture in the industrial field, we need to strengthen 5G technology to ensure the security

service effect of the industrial internet, so that the management and control can be practical, and the industrial internet can be safely managed under the security requirements of operators, so that the staff can meet the basic conditions, it can realize the repeated authentication of industrial internet to ensure the safety problems in work. Under the application of the internet security architecture in the industrial field, it can also provide multiple guarantees for different work businesses, and appropriately increase the supervision of comprehensive operation. If internet security problems occur from time to time in the industrial field, based on this support, the problems can also be solved at the first time.

4.3. Take dynamic monitoring

When monitoring the safe operation of the internet in the industrial field, staff need to ensure that relevant personnel have a sufficient understanding of security procedures and specific needs. In order to further improve the application efficiency of internet security, it is necessary to strengthen the application of 5G technology so that it can play a role in security monitoring, which will effectively reduce the difficulty of security monitoring and ensure that operators and managers can have a deeper understanding of the performance and causes of security problems in a short time. Then, we can solve different problems with the transmission function of 5G technology, optimize various problems, minimize the probability of security problems, and ensure that the scope of 5G technology in Internet security application can be expanded. The application of network technology and related systems to monitor the application of the internet in the industrial field can also more clearly display the relevant information of the monitoring results. At the same time, it can also strengthen the operation of the industrial internet, moderately increase the transmission of information, and enable different departments to further optimize the security problems under the condition of fully mastering the basic requirements through guidance

4.4. Strengthen control

Since there are many factors to be considered during the application of internet security management in the industrial field, the relevant personnel of the enterprise should pay attention to controlling the possible problems during management. In this context, enterprise managers or relevant personnel can control the security application of the internet in combination with the actual application of 5G technology to minimize the risk, so as to ensure the security management of the internet in the industrial field and improve the level of comprehensive development. In the process of applying 5G technology to control the security of industrial internet, the staff should first understand and be familiar with the principle and application of 5G technology, be able to solve the problems in practical work, realize efficient control, and eliminate the possible security problems. Ensure the security of industrial internet and the transmission effect of different types of information data within our ability [3]. Generally speaking, different types of obstacles may be encountered in the practical application of industrial Internet for security control. At this time, it is necessary to give full play to the advantages of 5G technology and reasonably control the strength of industrial Internet security control, so that the security and stability of the internet can be maintained and guaranteed, promote work progress and continuously improve the development level of the industrial field, and enhance the information supervision effect of industrial products.

4.5. Maintain safe operation

The industrial field covers a wide array of project content, which raises the probability of issues in the process, which will have a greater direct influence on the industrial field's development level and social standing. As a result, with the help of 5G technology, the enterprise's staff can maintain the operation of the industrial internet, enhancing the effect of the internet system in the basic information of each work in the industrial field, preventing various problems caused by insufficient basic information in the process of

work development, and providing a more substantial basis for the industrial field's subsequent development. Of course, using 5G mode in the industrial internet can help to avoid common security issues, ensure the security and stability of various basic information transmissions, and manage industrial internet security with the help of various data, highlighting the safe use of 5G in the industrial internet. At the same time, the 5G network should be used to ensure the safety of industrial internet operations. At the same time, 5G should increase its practical function, ensuring the safety effect of industrial internet and reducing the difficulty of safety management in the operation of industrial internet, taking into account the current state of industrial development [4].

5. Conclusion

The development and implementation of 5G technology is now the prevailing trend. To ensure deep integration of this technology with the operation of the industrial internet and to further ensure safety and stability, we must not only realize efficient management of the industrial internet, but also strengthen the application of 5G technology to ensure the safety of the industrial field under the application of 5G technology, and control faults with problems within the minimum range. Simultaneously, relevant professionals should continue to research the integration of 5G technology and industrial internet in order to increase internet security and innovation, as well as encourage the better growth of China's industrial sector. In short, staff and managers should improve the existing problems of the industrial internet, further improve the security management level of the industrial internet, and promote the sound and rapid development of the industrial field.

Disclosure statement

The author declares no conflict of interest.

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