A Review on the Application of Edge Computing in Internet of Things

Abstract -- With the rapid development of Internet of Things technology,the Internet of Things has encountered many problems,such as delay in transmission,delay in computing,storage consumes a lot of space, privacy and security question.Edge computing, as a new computing paradigm, is playing an increasingly important role in the field of Internet of Things. This article will discuss the application scenarios, advantages, and challenges of edge computing in the Internet of Things.

Keywords :IoT,Edge Computing,application scenarios.

1. Introduction

Internet of Things technology refers to connect everything through sensor and internet and sent the data to the platform,and then using cloud computing empower things with intelligence.For Edge Computing,It is a computing mode that is physically close to the source of the network edge detection, an open platform that integrates

the core capabilities of the network, computing, storage, and application, and provides edge intelligent services nearby.It stimulates the development of IoT.

2. Application in different scenarios

(1) Application in smart home

Through edge computing,we can achieve the goal to control the devices in our home in time and manage them intelligently.It is easy to open our TVs and wash machine in a low delay.What's more,the edge computing can offer us the ability to deal the real-time data may conducted by monitor,the smart door locks and so on.

(2) Application in autonomous driving cars

As this technology is applied with AI capabilities based on the accurate collected data, it would be incredibly beneficial to analyze and manage big data.Edge computing is the right model for achieving rapid computing processes to handle exactly the vehicle[1]. Processing such kinds of real time tasks and intermediate responses are handled by the edge computing system instead of reaching to the cloud server[2].

(3) Application in smart grid

It is a richer Internet application things other than edge computing. The buildings here are multilevel is determined by the grid of sensors and small tools.Some information may be time sensitive and may constant processing is required within the range of milliseconds to decimals A few seconds. The first layer is to solve the connectivity between them Machines can collect and process the most sensitive information The remaining layers can solve the problem Information analysis and long-term storage[3].

(4) Application in smart manufacturing

In industrial production, edge computing can realize real-time monitoring and fault prediction of equipment. The data collected by sensors is analyzed at the edge of the device, which can promptly identify potential problems, avoid equipment failures and downtime, and improve production efficiency.

3. The advantages of edge computing

(1) Low latency

Edge computing transfers the task of data processing and analysis to the edge of the device, reducing the delay of data transmission and making real-time response possible. This is of great significance for applications that require high real-time performance, such as autonomous driving and face recognition.In the field of face recognition,the response time reduced from 900ms to 169ms[4].

(2) Improve security

In edge computing, data is mainly processed and stored at the edge of the device, reducing the risk of data leakage. Meanwhile, due to the reduction in data transmission volume, the likelihood of network attacks is also reduced.

(3) Reduce space and bandwidth cost

Edge computing supports local processing and analysis of data, reducing the need for data transmission, thereby reducing space and bandwidth cost. This is particularly important for large-scale deployment of the Internet of Things.

4. Challenge in IoT

While edge computing has clear advantages in terms of reducing processing time and improving application performance, it will require new security guarantees due to its infrastructure. Without higher security specifications, more and more devices are connected to each other, which leads to network vulnerability. Processing and storing data on edge devices can be easily exploited by threat attackers. From a data security perspective, encrypting data over a network is more secure than data being processed. Therefore, centralized computing networks and cloud computing are more reliable for handling sensitive data and special rule requirements[5].

5. Conclusion

All in all, edge computing has a wide range of application prospects and significant advantages in the field of Internet of Things. However, to achieve the deep integration of edge computing and the Internet of Things, a series of technical challenges and security issues need to be overcome. In the future, we will continue to pay attention to the development of edge computing in the Internet of Things and

explore the possibilities of more innovative applications.

6. Reference

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