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Development and Data Storage of Sports Teaching Live Broadcast Platform Based on Mobile Device Edge Computing

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Abstract:Aiming at the problems of low computing power and limited storage capacity of mobile terminals, a lightweight identity authentication protocol suitable for mobile edge computing environment is proposed. This protocol combines cryptography with the security protection technology of the physical layer. The system is a web software system based on the Internet network, which provides both teachers and students with the necessary network teaching environment and related tools for online teaching. To integrate the text, graphics, voice and video document systems required for the course, relying on Yu Classroom, Xuetangyun, Chuangao APP, WeChat group and other platforms to create "theoretical learning + live teaching + MOOC video + online Q&A" four the integrated teaching mode has achieved teachers' teaching, students' independent learning and multi-channel interaction between teachers and students.

Keywords: Data Storage, Sports Teaching, Live Broadcast Platform, Mobile Device Edge Computing

1. INTRODUCTION

In recent years, as mobile devices (smartphones, laptops, and tablets, etc.) play an increasingly important role in people's daily life, such as learning, entertainment, and socializing [1], mobile users are increasingly concerned about data transmission rates and services. The demand for quality is also increasing. Although new mobile devices have more and more powerful computing power. In this context, many IoT applications emerge as the times require, such as crowd sensing, intelligent monitoring, and Internet of vehicles applications [2].

In this type of application, the IoT device will periodically collect the specified data, process it locally or upload it to the cloud server for analysis [3]. At present, there are only 20 physical education teachers on the front line of teaching, so there is a serious shortage of physical education teachers, which causes the number of people in physical education classes is large and the quality of teaching is poor [4]. If online teaching is adopted, it is possible to set up sub-points and focus on online teaching, which ensures that students receive the teaching of the best teachers. In order to save the school's educational space and optimize the teaching staff, a curriculum education platform using Internet technology is used as the times require. Health [5].

In the traditional physical education teaching work, the physical education knowledge is taught by the physical education teachers, and the students can only passively accept the teaching content, and the effect is low. Secondly, traditional physical education relies on the single explanation and demonstration of physical education teachers, and the level of different physical education teachers is uneven, and the teaching effect is usually limited to their own physical education level [6]. Emphasizing sports is one of the school-running characteristics of Nankai School. The construction of the "Nankai Model" for online teaching during the epidemic period and the exploration of the implementation strategies of online teaching of physical education in colleges and universities will provide important reference and reference for the successful completion of online teaching in colleges and universities across the country [7].

The rapid development of "5G" technology provides technical support for MEC, and the large-scale application of IoT in various industries provides MEC with broad application scenarios [8]. MEC is speeding up the development of various industries with its security, speed, scalability, versatility, reliability. But even these new devices may not be able to handle computationally intensive applications (such as virtual reality, augmented reality, face recognition, etc.) [9]. In addition, the power consumption caused by running applications with high computing power requirements is still a major obstacle that restricts mobile users from fully enjoying such applications [10].

At present, the combination of IoT devices and the cloud is the main mode of IoT applications. However, the long-distance communication between IoT devices and remote cloud platforms has the problem of unstable network transmission delay, which will lead to excessively long delays in IoT applications and cannot meet applications with specific delay requirements [11]. According to the "Internet +" education, the construction of smart classrooms has become a new direction for future education development, and it will also have a revolutionary impact on the teaching of traditional sports technology courses. Network teaching puts forward higher requirements for teachers' teaching methods and basic quality [12].

First of all, teachers must master certain information technology knowledge, namely computer technology, multimedia technology and network technology. Only by mastering the teaching tool and means of information technology can they be skillfully used in teaching [13]. As for distance physical education teaching, domestic Scholars and experts have little research. However, due to the need to provide larger venues for sports activities, and the complicated classification and borrowing of sports equipment, school human resources have not been used more reasonably [14].

The physical education platform uses the Internet to reintegrate the scattered multimedia teaching resources, accelerates the dissemination of resources, promotes the sharing of educational resources, and improves teaching efficiency [15]. The sixth is to vigorously promote educational informatization and support schools to make full use of information technology Carry out the reform of talent training models and teaching methods, carry out the optimization of educational governance capabilities under the support of big data, and promote the use of Internet and other information-based means to serve the entire process of education and teaching [16].

Traditional cloud computing needs to transmit information to the data center for processing, which will cause losses to delay-sensitive applications, such as smart vehicles and telemedicine. If all information is sent to the cloud center for processing, it will take too long. And mobile edge computing works by sinking the cloud data center to the network edge [17].

2. THE PROPOSED METHODOLOGY

2.1 The Edge Computing for Mobile Devices

The integration of the MEC platform in the mobile network environment brings many challenges related to service orchestration. Because the number of server nodes in the network increases, the system needs to effectively manage the resources (computing resources, storage resources) of each MEC server. At the same time , due to the mobility of users, the dynamic changes of radio network resources are induced.

In summary, the existing identity authentication schemes have been greatly improved in terms of feasibility and security, but the use of the above schemes in MEC scenarios is unreasonable to some extent. The concept of mobile edge computing is to extend cloud computing functions to the edge of the mobile network. The advancement of cloud computing technology has made it easier to deploy virtual machines on a large number of general-purpose servers such as base stations and gateways. In order to save the energy of IoT devices, while effectively In recent years, many researchers have carried out research on the joint scheduling problem of computing offloading and server resources in mobile edge computing.

The MEC network system is a three-level hierarchical structure, as shown in Figure 1, including different functional entities such as registration center (RA, registration authority), MEC server (MS, MEC server) and intelligent terminal equipment. The main idea ofSDN is to separate the control plane and data plane of the network. Its advantages mainly include creating a network control plane on general-purpose hardware, exposing network functions through APIs, remotely controlling network devices, and logically decoupling and decoupling network intelligence into different networks. The software-based controller. This information can be used to estimate the execution time and energy consumption of the current task on each IoT device and edge server, which is crucial for the scheduling of the framework. COMED needs access to these configuration files for better offloading of tasks.

2.2 The Physical Education Live Broadcast Platform

This paper takes the analysis of the inherent risk factors of the school's outdoor sports field practice course as a logical starting point and uses the risk management theory and system theory as the theoretical basis. By practicing the course risk management model, students can easily attend classes, check grades, select items, ask questions to teachers, and discuss with each other. The system provides complete user management, courseware content and other management functions; it has reliable security, and the permissions of users at all levels are strictly limited, and each user can only access the content he should access.

The detailed exploration of the implementation process aims to provide effective risk management guidance and reference for the implementation of field practice courses in colleges and universities, dispel the concerns of various schools on the development of outdoor sports courses, and promote the sustainable and healthy development of outdoor sports courses in schools in my country. In the development of the network platform, Windows 2000 server is used as the operating system of the website, IIS is used as the web server, and Dreamweaver canthus of Micromedia and ASP of Microsoft are selected as the web development tools.

2.3 The Development and Data Storage of Live Broadcast Platform for Physical Education

The intelligent terminal device can be a mobile device with communication and sensing functions. Because the intelligent terminal device is limited by computing resources and batteries, it cannot complete huge computing tasks in a short time, and some computing tasks need to be offloaded to the MS. Students can check the learning repeatedly to meet the learning requirements, and at the same time, the software background can record the data of the corresponding learning activities for the reference of teachers in the process evaluation. It also includes the standard action model of each technical action, so that students can obtain the intuitive cognition of correct action in repeated viewing. Take out the sports items in the item table as the drop-down list basket value.

The Academic Affairs Office completes all physical education courses and connects with the course selection information of Rain Classroom, Xuetang Cloud and Chuangao Platform. All teachers of the Ministry of Sports complete the identity binding and membership application of Rain Classroom, and "group announcements" through Rain Classroom. Users must register with RA to become legal users before accessing the services provided by MS. The user submits a registration request to the RA, and the RA generates a master key for the user. The user and the RA communicate through a secure channel. And provide action reference for self-learning. The function of the individual guidance module realizes that students can get one-on-one personalized guidance from teachers by uploading practice videos, find problems in the learning process, and teachers will guide, correct and guide corresponding learning strategies.

3. CONCLUSIONS

This paper proposes a mobile edge computing framework COMED based on ultra-dense networks. IoT devices can offload tasks to the mobile edge cloud server by associating with the most suitable base station. As an extension of school physical education classroom, sports network teaching plays a certain role in assisting students' autonomous physical education learning. The school uses the asynchronous teaching function of the sports network teaching platform to manage and guide the school's extracurricular physical

exercise, which has a lot of room for development. The distance physical education platform designed in this paper enriches the traditional physical education activities, optimizes the school's teaching resources, and has broad application prospects.

4. REFERENCES

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