

RESEARCH ON THE OPTIMIZATION OF ENROLLMENT DATA RESOURCES BASED ON CLOUD COMPUTING PLATFORM

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ABSTRACT

Cloud computing as a new computing model is applied to the network, its advantages of low cost, high performance determines the has gradually become the main mode of network service, and gradually used in our life, study and work. This paper describes the concept and characteristics of cloud computing, and according to the characteristics of cloud computing, combined with the admissions process in the actual situation analysis, preliminary exploration in admissions to establish effective cloud computing admissions service platform.

Keywords: Cloud computing, Low cost, Super computing, Enrollment, Information query.

1. INTRODUCTION

In the twenty-first century, with the popularization of computer and the rapid development of network technology, the computer and network technology have been applied widely in college enrollment management. The publication of enrollment information, recruitment of students, communication of admissions staff, and so on, are based on the computer and network technology. In our country, the college, still as a single unit, through the network, provides the nation with a range of services in enrollment. But, because of the asymmetry of information, the candidates may be unable to get the useful information in time due to various reasons and lead to failure of the college entrance exam. However, the concept of cloud computing is proposed to solve this problem effectively. The college will be able to providing timely and accurate enrollment and management information service for societies, schools, students and parents by setting up a set of cloud computing service platform.

2. THE DEFINITION, BASIC PRINCIPLES AND METHODS OF CLOUD COMPUTING SERVICES

The cloud computing is based on the development and combination of following computer and network technology, distributed processing, utility computing, parallel processing, storage grid, grid computing, virtualization, load balance, and so on. It mainly refers to the abilities that the users can access to certain information (hardware, software, business process and data storage, etc.) through the Internet. Users not only don't know how these abilities to obtain, but also don't

care about how these abilities come from. Users of cloud computing service do not need to install any system in the local computer to establish a local service platform, only need to turn on the cloud computing service system to get the services they need.

Cloud computing service is characterized by the following: (1) Cloud storage data. Users no longer store the data in the local computer but store in the network storage space which provides by the cloud services platform. Users can access data, share resources based on the authority. (2) Cloud software service. Users can directly use the software instead of downloading the software which installed on the cloud server. (3) Providing services anytime, anywhere. As long as users log in a cloud service platform by using the terminal equipment through the network, they can enjoy the service provided by the service platform. (4) Fully meeting user's needs. Cloud computing service platform which integrate the network resources, can be customized according to different needs of different users. Furthermore, with the increasing of users, more and more resources are integrated, and more and more personalized services are provided.

3. THE DEFINITION AND CHARACTERISTICS OF P2P TECHNOLOGY

3.1 Final Size

P2P (peer-to-peer) means peer-to-peer network. Its main idea is "decentralization", and each computer in the network is equal, that acts as a server and acts as a client at the same time. P2P network technology can make full use of the ability of the network edge node, so as to reduce the dependence of

the client computer to the central server. Therefore, the use of P2P network technology can help us solving the limitations of the network size of the traditional C/S mode, meanwhile, improving the client computer information exchange efficiency in large-scale network environment.

The characteristics of P2P network technology are mainly reflected in the following aspects:

1) Decentralization: Each node computer in the network is the network resource and provides the network service. The transmission of information and various software services is no longer required the intervention of intermediate links and servers, but is directly conducted among the nodes.

2) Adaptability: In the whole P2P network, resource and service capacity is dynamic changed, mainly is determined by the number of users joined the network. The system will change with the addition of users and the exit.

3) Robustness: Because the P2P network system is composed of all nodes, resources and services in the network are distributed among the nodes, even if some nodes or networks suffer from attacks, the overall impact is small. Therefore, the structure of the system has the characteristics of high fault tolerance and resistance to attack by nature.

4) High performance price ratio: P2P system architecture uses a large number of common node computers distributed in the Internet that can be effectively utilized. These computers take on computational tasks or data storage, so as to achieve the objective of high performance computing and mass storage.

5) Load balance: Due to each node computer acts as both a server and a client in P2P environment, the demand for server computing ability, storage capacity in traditional C/S structure is reduced. At the same time, network resources and services are distributed in multi node computers, thus, the load of the whole network becomes more balanced.

4. SYSTEM DESIGN

After the analysis of enrollment work, research and continuous tracking of the entire enrollment process for 5 years, the author proposed a cloud computing platform based on P2P technology. The platform is built on the base of the mature B/S model combined with P2P technology. In this enrollment management service platform, admission administration departments and enrollment examination institutions at all levels, universities jointly constitute first level initial resource cloud node, all the high schools compose the second level initial resource cloud nodes. As a provider of resources, the first level resource cloud and the second levels resource cloud jointly provide services to students, parents joined the system. After logging in the network through the registered account, students, parents form the third level resource cloud. Finally, the third level resource cloud, with the first two levels resource cloud, combine into the enrollment management services cloud which providing enrollment management services to the outside jointly. The platform structure diagram is as follows.

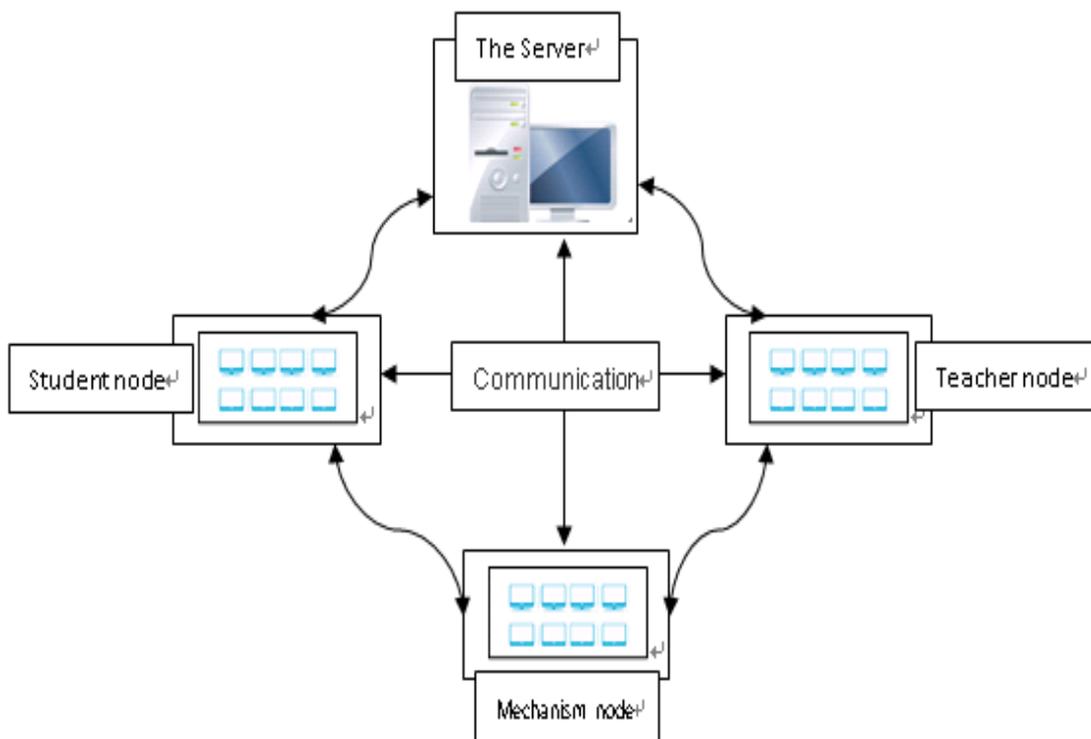


Figure 1. The platform structure

We use the index server group to take on network management, increase the index server in time according to actual needs. The index servers do not participate in the operation and transmission of data, they are only used for the customer registration, authentication. Peer to peer

communication is adopted between nodes. The enrollment management services platform is oriented to students and parents as the center, and is built as a learning, communication, mutual platform meeting students and parents' demands.

In the enrollment management services platform, the resource cloud is composed of admission administration departments and enrollment examination institutions at all levels, universities, all the high schools. These departments, teachers and staff act as providers of enrollment management resources, are responsible for the release of enrollment information resources. Students and parents as the main participants in enrollment management services platform can obtain resources from primary resource cloud and secondary resource cloud after joining the platform, and the resources they have acquired are then reorganized into a new resource cloud to provide information resources to other new members of the platform.

Student first sends a service request to the index server, after receiving the request from student, the index server will provide the corresponding services for student based on the results which querying resources in the enrollment management services platform. The information indexing service of the enrollment management services platform follow the following principles: The index server receives a service request and then tries to find the resource location and other information according to the stored information resources index list. Specific service strategies can be divided into the following 3 cases:

a) When the tertiary resource cloud (established by students, parents) nodes have the information resources, index server sends messages directly to tertiary resource cloud nodes, then the tertiary resource cloud nodes establish a connection with student to provide a required information service.

b) When the tertiary resources cloud nodes do not have the information resources, the index server continues to search the secondary resource cloud. when the index server finds the s secondary resources cloud with the information resources, the index server sends a message to the secondary resource cloud nodes, then the secondary resource cloud nodes provide information services to student who sends the request.

c) When the tertiary and secondary level cloud resources neither have the information resources, then the primary resource cloud directly establish a connection to the students to provide services for students.

Above service process a is not visible to student. After sending service request, Student just waits for the platform to provide services. At this time, enrollment management services platform is a resource cloud for student, provide services unified for users, and it's internal resource discovery and scheduling process is not visible to users.

5. SYSTEM MAIN FUNCTION

5.1 Information integration function

Enrollment management services platform makes the national universities, enrollment institutions at all levels and enrollment related units integrated, students and parents only need to login enrollment management service platform and query the enrollment management information they want to know, including each university's specialties admission batch, enrollment plan, enrollment charter, yearly admission data, enrollment arrangement, entrance examination note, etc. When students want to query for all the colleges and universities' enrollment plan information in a few years ago, they need login each university's website and often

experience some problem or another issue that cause they fail to get requisite information in time, so as to suffer from adverse effects while apply for admission. After establishing the national enrollment management services platform, students can just log on to the platform to be able to get the various colleges and universities' information they want to query, timely, accurately, fast and easily.

5.2 Function of short message platform

In the enrollment process of college entrance examination, what students, parents most urgently want to know is whether they have been admitted, which college they have been admitted, what specialty they have been admitted, the reason if they have not been admitted as well as archive status of candidates and so on. In the past, students, parents are very difficult to query accurately or almost cannot query these information. Now, through the national enrollment management services platform, as long as they log in the platform they can accurately query this information above. At the same time, we will notify all candidates by sending a short message. If the candidates' archive status changes, we will send a short message to candidates who register on the platform in order to allow them to know exactly their admission status. This method increases the transparency of the college entrance examination and college enrollment process and brings to openness, fairness and justice, makes enrollment work the real "clean admissions".

5.3 Exchange interaction

The enrollment management services platform provides the online interactive features, as long as users login enrollment management services platform as a registered user, they can query the enrollment information of each college in the country, and make online consultation or communication with the admissions staff of each university. So that is not only conducive to the candidates for better understanding the school and enrollment policy, making a decision on schools and specialty according to their own actual situation, but also conducive to better working in enrollment.

6. CONCLUSIONS

With the advent of the information age, more and more people are willing to upload their own information and resources to the cloud and share with friends or strangers, and enrollment information sharing will bring more and more candidates the key to success. Meanwhile, cloud computing is a parallel and fault-tolerant and linearly scalable calculation, and this kind of computing resources saving and green environmental protection technology also has important significance under the social background of tackling global warming.

REFERENCES

1. Wang Peng, The Key Technology and Application of Cloud Computing, Beijing, People's Posts and Telecommunications Press, 2010.

2. Lu Xu, Zhang Zheng, Zhu Qiyong, Suheng, Cloud The Future Of Education Informationization, *Science and Technology Magazine*, 2011.
3. Yang Xue, P2P Platform JXTA Protocol Analysis and Application, Master's thesis, Southwest Jiao Tong University, 2007.
4. Li Weihao, P2P Technology to the Network's Impact and Its Development Research, Master's thesis, Sichuan University, 2006.