

Construction and Implementation of Innovation and Entrepreneurship Platform Based on Cloud Computing under the Background of Big Data Era

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Abstract: In recent years, the development of big data(BD) has put forward new requirements for information management in the traditional sense. Cloud computing(CC) is a new computing model based on distributed storage, supporting dynamic load, virtualized network and other technologies. It provides users with a virtualization service platform, which can effectively reduce resource consumption, improve work efficiency, reduce enterprise operation cost and maintenance cost, and enhance enterprise competitiveness. The innovation and entrepreneurship platform(IEP) of CC is a new business model. Its main purpose is to realize resource sharing and data storage to promote the development of e-commerce. Firstly, this paper introduces the advantages of IEP based on CC, and then expounds the current situation of IEP, as well as the current situation and the causes of the problem. After that, the CC technology based on BD background is studied, the framework of IEP is designed, and the performance of the platform is simulated and tested. Finally, the test results show that the operation time and delay time of the IEP are 2-3 seconds, the CPU occupancy rate is about 3%, and the occupied memory is maintained at about 3500K. Therefore, this shows that the performance of the IEP meets the needs of customers.

1. Introduction

With the advent of the BD era, CC is gradually becoming a new technology, setting off a profound change in the Internet field. The IEP based on CC is very meaningful, valuable and promising, making the IEP one of the indispensable key technologies in social development and economic growth [1-2]. CC is a way to process and utilize massive, heterogeneous or semi-structured data through the network, and realize information sharing through the Internet [3-4].

Many scholars have done relevant research on CC. The IEP based on CC has a certain foundation abroad, and Chinese scholars have made some progress in this field. However, at present, the domestic research on this technology is not mature enough. Some scholars believe that with the advent of the era of BD and the trend of large-scale and highly integrated information resources.

New concepts such as the Internet and the Internet of things are gradually integrating into people's life [5-6]. Cloud service providers should solve the current employment problem through IEP, which is one of the future development directions. Scholars also analyzed the construction of Networked IEP in the era of BD from two aspects: information flow mechanism and information processing mode [7-8]. Other scholars systematically discussed the construction, evaluation and optimization of IEP based on BD environment through literature analysis. The above research has laid a research foundation for this paper.

This paper makes a detailed study on the construction of IEP under the background of BD era. Firstly, the cloud environment and related concepts are briefly described. Secondly, from a multi-dimensional perspective, combined with the current social mainstream, the solution design idea and framework structure based on large database technology are proposed. Finally, a cloud service platform with scalability, stability and reliability is built by using object-oriented modeling method, and data sharing and information interaction are realized through the system.

2. Discussion on IEP Based on CC Under the Background of BD Era

2.1 Advantages of CC Based IEP

Flexibility of CC. Due to the huge amount of information in the era of BD, the traditional computer network platform can not be compared in processing capacity and computing speed. The IEP based on CC can be customized according to user needs [9-10].

Huge data storage capacity. Due to the rapid development of Internet technology and a wide variety of mobile terminal devices, information presents an explosive growth trend in the era of BD. Through real-time monitoring, analysis and processing of user access, query and other behaviors, it can also provide corresponding functional operation interfaces according to different application scenarios. When mining a large amount of data, it can also integrate different types and different group characteristics, so as to form a multi-level structured structure model, which brings more diversified development platforms and ways for entrepreneurship and innovation [11-12].

Strong dynamic scalability. It can realize dynamic expansion, real-time update in the virtualized environment, and provide users with more personalized, diversified and humanized services. For example, in online shopping, you can select the corresponding functions according to different customer needs. After the relevant parameter values are obtained through the analysis of commodity price information and other data, they can be allocated to different categories of customer groups. It can also use the large database to store a large number and a wide variety of data, and realize dynamic scalability.

2.2 IEP

1) Current situation:

In the era of BD, the IEP of CC is a new thing and is still in the development stage. For many entrepreneurs, they often encounter "excess information" and "insufficient professional skills" when making Internet choices. Most platforms have single functions and slow update speed, lack of corresponding professional management and maintenance, can not meet the personalized customized services required by customers, and can not adapt to the development trend of e-commerce under the background of the information age. Due to the complexity and diversity of BD itself, it is necessary to analyze and process a large number of user information to realize personalized services. In addition, for different types of application fields, there should be different solutions and process design to meet a variety of needs and provide a good platform development environment.

2) Existing problems

First, there is a lack of effective data collection platform. When building an IEP, CC service providers need to fully collect a large amount of customer information and user needs. However, at present, most software companies in China have not established a complete and scientific database system to provide enterprises with relevant technical support or product analysis consulting services. Secondly, it lacks the ability to predict the changes of market environment and industry trends, and does not have pertinence, which leads to its inability to effectively obtain the latest dynamic data or prediction results. Thirdly, there is a lack of perfect BD platform with operability and usable value.

3) The reasons for the existing problems of the IEP are as follows

first, the innovation technology protection of the platform is not enough. At present, China's laws and regulations on entrepreneurship are not perfect, and there is a lack of relevant systems such as the protection of intellectual property rights and data resources. Second, the degree of information sharing is low. Because CC is based on the development of application services rather than object-oriented system architecture design, there are many difficulties and challenges in the research of deployment scheme. At the same time, due to the limited network bandwidth and the uncertainty of user requirements, the availability of the platform is not high. In addition, the current rapid development of Internet technology, Many enterprises will be limited in obtaining data resources through third-party software companies.

2.3 CCTechnology Based on BDBackground

1) Concept

In the concept of CC, it mainly refers to the development, sharing and utilization of relevant information resources and services through the Internet. In a broad sense, it includes a series of functions built on computer or network-based platform and running in virtual environment. In a narrow sense, CC is a network-based virtualization and distributed service. Supported by BD, it provides users with required resources, including information and knowledge, through the Internet, and realizes information sharing, resource integration and sharing services. It can not only bring convenience to our daily life, but also promote social and economic development and improve work efficiency. At the same time, it can also improve the resource allocation rate, reduce enterprise costs, improve the sense of user experience and increase product value, and realize the personalized service demand for a large number of customers on a large scale. Its significance is very important.

2) Algorithm

The allocation of CC virtual machines is a multi-objective cluster problem, that is, a multi-objective combinatorial optimization problem. The allocation problem of multi-objective virtual machine is regarded as a multi-dimensional cluster problem. The resources (objects) of each virtual machine are also a C-dimensional vector. The goal is to put multiple virtual machines (objects) into multiple virtual nodes (boxes) and minimize the number of occupied virtual nodes and the load variance value. The allocation problem of multi-objective virtual machines is described as follows:

$$f_{PN} = \min \sum_j C_j, f_{LB} = \min \frac{\sum D_i}{c} \quad (1)$$

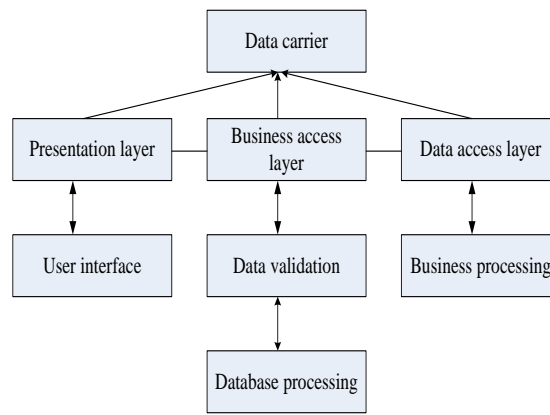
Where, FPN represents the number of virtual nodes occupied and represents the balanced load variance of server FLB cluster.

$$D_i = \frac{\sum^n (P_{ij} - \bar{P}_j)}{n} \quad (2)$$

Where, n represents the number of virtual nodes, PI represents the average value of the i-dimensional performance characteristics in all virtual nodes, and the performance characteristics are normalized values, that is, it is equal to the remaining allocation of the i-dimensional resources in the virtual nodes divided by the total i-dimensional resources.

3. Experiment

3.1 IEPFramework



tabure 1: IEP framework

The IEP based on CC is based on Internet technology and realizes dynamic management by integrating network information, data and resources, so as to meet various problems encountered in the process of enterprise development. It integrates information data and knowledge management, and realizes intelligence through integration and sharing, so as to provide customers with better services. As can be seen from Figure 1, data collection includes user login information, resource sharing and resource allocation. Business analysis obtains useful data by mining user access records and related keywords, and stores them in the cloud database. At the same time, corresponding functional services can be provided according to different application scenarios. Management control includes cloud server-side hardware equipment and network resource management. The platform provides an architecture with CC as the core technology, covering various types of data processing modes of innovative and entrepreneurial enterprises.

3.2 Performance Test process of IEP

The performance test of the IEP is mainly to test whether the system operation status and performance meet the requirements. The IEP based on CC uses data analysis technology to comprehensively test each functional module of the platform to ensure that each part can operate normally. Then combine the whole project process with software requirements, make effective statistics on network information and user behavior through continuous debugging and improvement, and use BD technology to screen information resources that meet system requirements, have high reliability and can provide real-time response from a large number of complex original resources, Analyze and evaluate whether the IEP under the CC environment can meet the personalized needs of customers. Finally, it has complete functions, stable performance,

high reliability and meets the expected requirements.

4. Discussion

Performance Test and Analysis of IEP

Table 1 shows the performance test data of the platform.

Table 1: Performance monitoring data of the IEP

Number of tests	Operate time(s)	Delay time (s)	Account for memory(k)	CPU availability(%)
1	2	1	3415	3
2	3	1	3652	2
3	4	2	3254	3
4	2	1	3487	2
5	3	2	3698	2

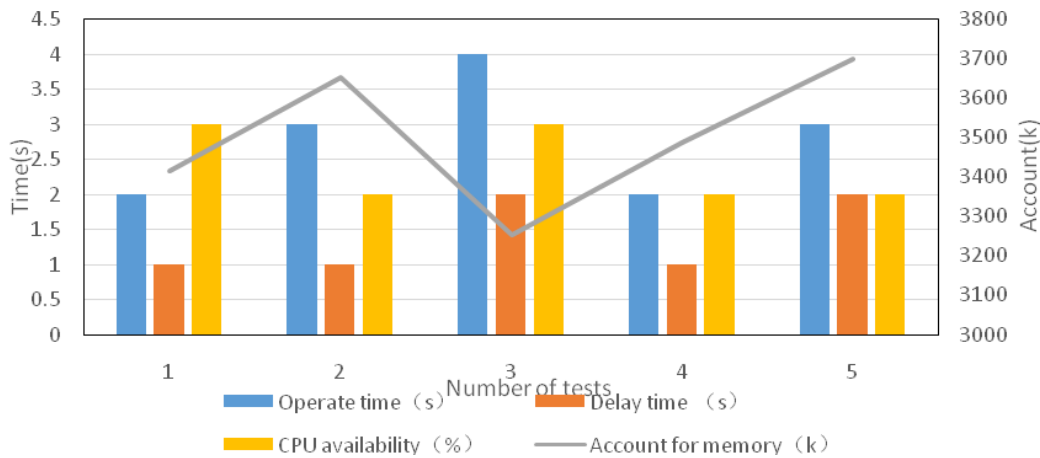


Figure 2: Performance comparison of the IEP

By testing the operation environment, data analysis ability and development tools of the platform, problems are found and solved in time, which provides a good development space for entrepreneurial and innovative talents. In the process of software product R & D, when there are various new situations or bottlenecks, it can respond quickly, and at the same time, it can translate these technologies into practical applications in relevant fields to improve efficiency and quality. From Figure 2, the operation time and delay time of the IEP are 2-3 seconds, the CPU occupancy rate is about 3%, and the occupied memory is maintained at about 3500K. Therefore, this shows that the performance of the IEP meets the needs of customers.

5. Conclusions

CC based IEP refers to the use of Internet technology and related services to provide users with personalized customized information, application requirements and other support functions. The platform can realize data sharing, resource integration and sharing and knowledge management. By analyzing the construction of IEP under the background of BD, and designing the IEP based on CC, this paper realizes three aspects: user-centered, open collaboration, collaborative cooperation and BD technology application. This paper mainly focuses on the construction and development of IEP based on CC.

References

- [1] Li W , Jiang B , Zhao W . *Obstetric imaging diagnostic platform based on CC technology under the background of smart medical BD and deep learning*[J]. *IEEE Access*, 2020, PP(99):1-1.
- [2] Xu L , Jiang C , Wang J , et al. *Information Security in BD: Privacy and Data Mining*[J]. *IEEE Access*, 2017, 2(2):1149-1176.
- [3] Wamba S F , Angappa G , Papadopoulos T , et al. *BD analytics in logistics and supply chain management*[J]. *International Journal of Logistics Management*, 2018:00-00.
- [4] Zhang Y , Qiu M , Tsai C W , et al. *Health-CPS: Healthcare Cyber-Physical System Assisted by Cloud and BD*[J]. *IEEE Systems Journal*, 2017, 11(1):88-95.
- [5] Athey S . [Special Issue Perspective] *Beyond prediction: Using BD for policy problems*[J]. *Science*, 2017, 355(6324):483-485.
- [6] Kuang L , Hao , Yang L T , et al. *A Tensor-Based Approach for BD Representation and Dimensionality Reduction*[J]. *IEEE Transactions on Emerging Topics in Computing*, 2017, 2(3):280-291.
- [7] Yaoxue, Zhang, Ju, et al. *A Survey on Emerging Computing Paradigms for BD*[J]. *Chinese Journal of Electronics*, 2017, 26(1):1-12.
- [8] Kusiak A . *Smart manufacturing must embrace BD*[J]. *Nature*, 2017, 544(7648):23-25.
- [9] Rathore M , Paul A , A Ahmad, et al. *Real-Time BD Analytical Architecture for Remote Sensing Application*[J]. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 2017, 8(10):4610-4621.
- [10] Xing H , Qian A , Qiu R C , et al. *A BD Architecture Design for Smart Grids Based on Random Matrix Theory*[J]. *IEEE Transactions on Smart Grid*, 2017, 8(2):674-686.
- [11] Wang Y , Kung L A , Byrd T A . *BD analytics: Understanding its capabilities and potential benefits for healthcare organizations*[J]. *Technological Forecasting & Social Change*, 2018, 126(JAN.):3-13.
- [12] Calude C S , Longo G . *The Deluge of Spurious Correlations in BD*[J]. *Foundations of Science*, 2017, 22(3):595-612.