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Design of Computer Virtual Load Balancing Simulation System Based on Cloud Computing Architecture

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Abstract: At present, with the development of high-performance equipment and systems, enterprise data and resources have developed rapidly. With the increasing number and types of internal data in enterprises, computer load has been difficult to meet the needs of data management. Therefore, building a scientific and reasonable computer virtual load balancing simulation system has become the key to the sustainable development of enterprise data management. However, the current computer virtual load balancing simulation system is not stable enough to efficiently handle concurrent task requests. In order to solve this problem, based on the overview of the definition, advantages and classification of computer virtual load balancing, combined with cloud computing architecture, this paper conducted an in-depth study on the design and construction of the simulation system, and tested the effectiveness of the system from three aspects: task scheduling, response time, and load standard deviation. The results showed that under 1000 concurrent task requests, the response time of the simulation system in this paper can be maintained in the range of 30 milliseconds to 50 milliseconds. From this data result, the computer virtual load balancing simulation system designed under the cloud computing architecture in this paper had a high adaptability to the data processing environment, and can timely and effectively handle concurrent task requests, and can achieve an ideal load balancing state on the basis of stable operation.

1. Introduction

With the mature development of network equipment and technology, the number of data processing and computing load faced by computers are increasing, which brings great challenges to enterprise data management. The traditional computer virtual technology has low resource utilization rate and poor parallel processing ability, which makes it impossible to achieve the unified management of servers, storage devices, network devices and data center resources. This not only causes problems such as high data operation cost, difficult deployment and maintenance, but also poses a threat to the development of data security. Therefore, expanding the bandwidth of computers and servers and building a virtual Load Balancing (LB) simulation system to meet the current data carrying requirements have become the key issues of current enterprise data management. With the continuous popularization of grid computing and virtualization technology, cloud computing architecture has made great progress and played its own application value in various industries. In the computer virtual LB simulation system, cloud computing architecture can better integrate various device data and applications in the computer network, and connect computing and storage resources, so as to maximize the sharing of LB and resources.

With the increasing of network data, computer virtual LB has been paid more and more attention by scholars. Kumar Pawan studied the problems and challenges related to the existing computer load balancing technology, and discussed several technologies to improve computer performance and resource utilization efficiency by using LB, task scheduling, resource management, etc. [1]. In order to solve the problems of large amount of redundant data and long service response time of computers, Liu Yuxin proposed a new service orchestration and data aggregation framework, which can realize data orchestration to achieve LB and reduce data redundancy and service response delay [2]. From the perspective of green scheduling, Sui Xin proposed a computer virtual intelligent scheduling strategy based on machine learning algorithm to achieve computer LB. The experimental results showed that compared with other classical algorithms, the proposed virtual machine scheduling strategy reduced energy consumption by 49.13% [3]. Hussain Altaf proposed a new resource aware LB algorithm to ensure the load balanced distribution of computer computing power. Finally, the experimental results showed that the proposed algorithm has substantial improvement in resource utilization and throughput compared with traditional heuristic methods [4]. These methods provide some reference for improving the concurrent processing ability of computers, but there are still some limitations in network flexibility and availability.

Cloud computing technology can improve computer data processing capability and network flexibility on the basis of ensuring virtual LB. Mishra Sambit Kumar proposed the LB method under cloud computing architecture to optimize different performance parameters, provided a classification for algorithms, briefly explained the performance parameters considered and their impacts, and finally carried out simulation in CloudSim simulator [5]. Polepally Vijayakumar proposed the LB technology based on constraint metrics, calculated the determinants of each computer, checked the load of the computer, and finally evaluated the performance of the proposed LB method through experiments. The results showed that the existing method can migrate seven tasks [6]. At present, many researches have effectively explored the application value of cloud computing architecture in computer LB, but most of them have only studied from a theoretical point of view, and have not explored the design and construction of its simulation system in depth.

Based on the cloud computing architecture, this paper conducted an in-depth study on the design of the computer virtual load balancing simulation system, and verified the effectiveness of the system from the three perspectives of task scheduling, response time and load standard deviation. The test results showed that, at the task scheduling level, the lowest scheduling times of the 10 types of tasks in this system were 2.1 times, and the average scheduling times were about 3.0 times. The minimum scheduling times of 10 types of tasks in the traditional system were 4.8, and the average scheduling times were about 6.2. At the response time level, the response time of each node in this system was relatively short and centralized, and the response time was basically maintained in the range of 30 milliseconds to 50 milliseconds. The response time of each node in the traditional system was relatively long and decentralized, with the response time ranging from 40 milliseconds to 110 milliseconds. At the level of load standard deviation, when the system ran for 30 minutes, the load standard deviation result of this system was 0.12, and that of the traditional system was 0.36. From the system test results, it can be seen that the computer virtual load balancing simulation system under cloud computing architecture was more operable.

2. Construction Method of Computer Virtual Load Balancing Simulation System

2.1 Overview of Computer Virtual Load Balancing

2.1.1 Definition and Advantages

Load balancing refers to the use of certain technical means to evenly distribute the work requests and data management tasks within the system to each server node in the back-end, so as to avoid system overload caused by concurrent tasks being transmitted to a single point, thereby improving task processing efficiency, saving network resource consumption, and achieving the overall LB status of the system [7]. Its technical principle is shown in Figure 1. LB technology has become the standard configuration of enterprise large-scale server cluster system. In addition to effective integration of various processing resources in the server cluster system, LB technology can also schedule and allocate tasks to different degrees according to different server performance and processing capacity [8]. On this basis, through the guidance and planning of LB strategy, the integration of nodes in the back-end server cluster can be completed to achieve its unified service to the outside. People can also set different individual service points in each independent node according to different needs, or combine unified services with individual services. On the basis of virtualization technology, computer LB technology can transfer the virtual machine with larger load to the virtual machine with smaller load, thus effectively reducing resource consumption. In addition, LB technology can also improve the business processing capacity of the cluster, maintain the stability of the cluster, and improve the traffic and load capacity of the cluster by allocating requests [9].

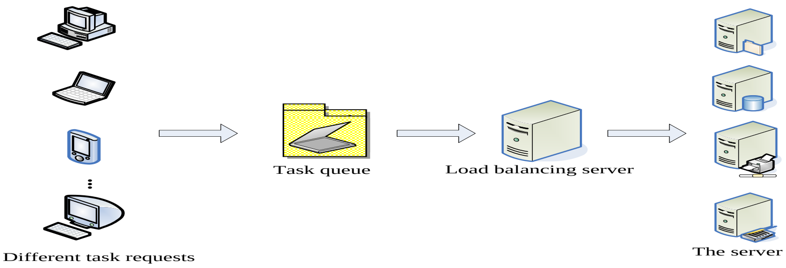


Figure 1: Principle of load balancing technology

2.1.2 Classification

With the gradual evolution of network computing mode, LB technology has gradually developed from static to dynamic, and centralized to distributed according to the strategy and system scale applied.

According to the difference of LB mode, it can be divided into static mode and dynamic mode. When the cluster system was just emerging, LB technology was still in its infancy, and most of it was completed by static methods. However, with the expansion of the network scale and the rapid growth of tasks, the performance of static strategies could not meet the data requirements well. Therefore, LB mode gradually turns to dynamic strategy.

(1) Static policy:

The static strategy would not dynamically detect the network server in real time, but strategy determine the allocation scheme according to the current server load before task allocation. No change would be made after the implementation of the scheme, and no corresponding adjustment would be made due to the real-time change of load. This method is easy to implement, and the additional consumption caused by LB is less. However, this strategy assumes that each task has the same resource requirements, and that each node has the same time settings for receiving tasks. It does not take into account the differences between tasks and computing nodes.

(2) Dynamic policy:

The dynamic LB strategy can detect the real-time working condition of the simulation system, and dynamically adjust the target node of task allocation accordingly according to the actual load condition of the system, so as to allocate more tasks to node servers with fast computing speed, thus improving the LB degree of the system and reducing the average response time of tasks [10]. However, because it is necessary to monitor the working conditions of each server in real time and analyze the load conditions of the system, this strategy usually increases the additional consumption of the system.

According to different load control methods, load balancing technology can be divided into centralized strategy and distributed strategy.

(1) Centralized policy

The centralized policy requires the establishment of an LB server in the system. The LB server would regularly detect the workload of other servers in the system, and then evaluate the load of each node server according to the detection data, and thus determine the load capacity of each node for daily task allocation. The tasks and requests in the system are uniformly distributed by the LB server, which is simple, fast and easy to correct. In the current data network environment, the computing speed of a single hardware with a centralized strategy is far from meeting the needs of computer data processing, and the improvement of LB performance is facing a huge challenge under this background. Because each node depends too much on the LB server, once the server fails, the entire simulation system would not work properly [11].

(2) Distributed strategy:

Different from the centralized policy, the distributed policy does not separately configure the corresponding LB server. Under this policy, all servers in the system participate in task scheduling. According to different algorithms, the distributed strategy would detect the load information of other nodes and share the load information. In the system, each node usually collects the load information of the nearby area, and searches from local to global to meet the needs of large-scale data processing. However, this policy deploys a large number of service instances on many physical hosts, which leads to the cost of hardware and software deployment. In addition, the distributed commercialization strategy also includes a large number of support services, such as distributed cache, database, etc. These services would increase the deployment and maintenance costs of the simulation system.

From the current LB policy classification, each type of policy has its own applicable scenarios and has different advantages. However, the limitations of each type of strategy are also obvious, and their defects are basically concentrated in the high application cost, poor robustness, and low operating efficiency.

2.2 Cloud Computing Architecture

Cloud computing is a cluster computing technology based on business operation mode. The platform can virtualize basic physical facilities into different resource libraries, and can effectively combine different services and resources. Through the dynamic configuration and monitoring of resources, cloud computing can achieve LB, high fault tolerance and data security maintenance, thus providing users with efficient, reliable and economical data processing, storage and application services.

As a resource network based on a diversified network computing model, cloud computing mainly combines various resources and services through virtualization and other technologies to provide users with platform, software and infrastructure services. In addition, this technology can realize the sharing of resource library through virtualization technology, and realize the management of resources through independent system software or service programs, thus providing users with a computing platform with super large scale, high stability and high availability.

Cloud computing has diversified characteristics, which are summarized in this paper as follows:

(1) Outward services: cloud computing mainly provides software programs and application platforms to users in the form of services. It is an organic combination of resources and services, and can provide users with diversified, open and high-quality services.

(2) Large scale: cloud computing provides massive storage and computing work for the data center, and large computers, servers, and storage are part of it.

(3) Virtualization: the basic architecture of cloud computing is mainly supported by virtual technology and dynamically configures various resources based on resource pools. This method can effectively avoid the heterogeneity of hardware platforms such as servers, so as to maximize the use of system resources.

(4) Scalability: the scale of cloud computing architecture can be dynamically expanded and extended, and computing resources can be correspondingly increased and reduced according to different task requirements, so as to adapt to the changing business needs of cloud computing users. In order to better manage and coordinate the resources of the network system, the cloud computing architecture can also build an extensible resource management and scheduling mechanism.

(5) On demand service: cloud computing architecture is a business computing model, which can centralize a large number of resources and provide them to external users in the form of services.

Cloud computing architecture refers to the centralized management structure of cloud services, including query services, creation services, monitoring services and distribution services, so as to realize the management and decision-making of the entire cloud system. According to different types of cloud services, one or more nodes in the cloud can cooperate to complete the monitoring and scheduling of services and resources, so as to achieve resource integration and enhance the system's scalability and flexibility. Its theoretical framework is shown in Figure 2. The whole architecture consists of four layers, namely cloud interface, cloud user management, cloud service and resource management, and cloud infrastructure.

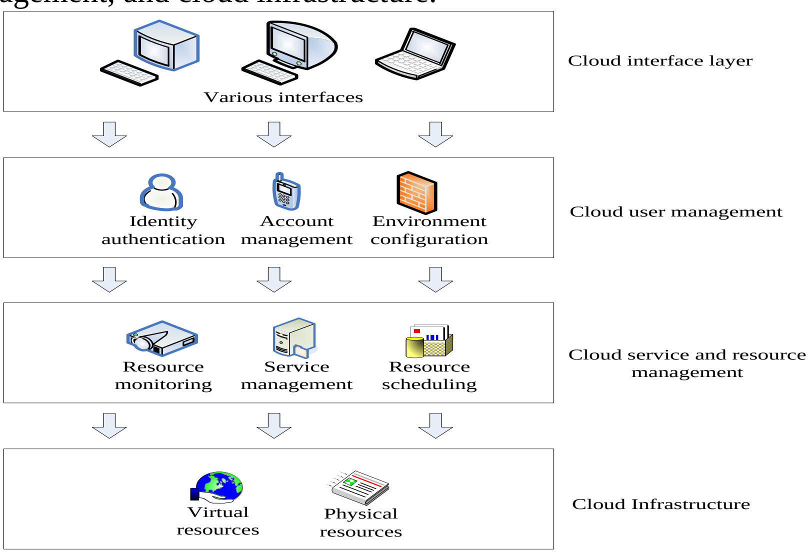


Figure 2: Cloud computing architecture

Cloud interface: since users can obtain cloud computing services through various network requirements, they need to provide network communication interfaces such as the Internet between cloud services and cloud user interfaces. In different application scenarios, user needs and user habits are different to varying degrees. Through the cloud interface, the cloud computing architecture can better realize the reuse of resources and the development of data componentization, scalability and flexibility.

Cloud user management: at the user management level, the cloud computing architecture can be allocated according to different needs. Users can determine certain restrictions according to their own use needs, such as the lowest limit of network traffic, the lowest resource utilization, and the highest consumption. In this scenario, users only need to pay for the resources used according to their own needs.

Cloud service and resource management: service management mainly includes request management analysis and quality control. After receiving cloud service requests, independent nodes in the cloud would use specific allocation strategies to schedule corresponding resources according to the requirements of cloud service types and quality of service. Cloud resource management is the real-time monitoring and scientific configuration of resources.

Cloud infrastructure: cloud infrastructure includes physical resources (physical resources) and virtual resources, which would be fully used within the framework. Physical resources generally cover network equipment, computers, databases and other hardware resource databases. The virtualization resources mainly include computing, storage, data and other service program resource libraries.

On the cloud computing platform that requires dynamic load balancing, it is assumed that there is a physical server s_x. This paper uses s_x to characterize the physical server. The current load of each physical server is expressed as l_x, and the server capacity is c_x. Server capacity c_x is the core number of servers, while the conversion formula of server load l_x is:

$$l_x = u_x \times p_x \tag{1}$$

Among them, u_x represents the current central server utilization rate of the server, and p_x represents the number of server cores.

The LB services in the cloud computing architecture are represented by set a_x, and each LB service a_x corresponds to a group of virtual instances, namely:

$$a_x = \{v_1, v_2, v_3 \cdots, v_x\} \tag{2}$$

It is assumed that all virtual instances are included in only one LB service, that is, for any load balancing service a_x, there are:

$$\sum_{v_x \in a_x} l_x = \sum_{v_x \in a_x} l'_x \tag{3}$$

For any virtual instance, there are:

$$l'_x \leq c_x \tag{4}$$

For any physical server s_x, there are:

$$\sum_{v_x \in a_x} l'_x \leq f_x \times c_x \tag{5}$$

Among them, f_x is the fault information of physical server s_x. All l'_x that meet the above three restrictions can be regarded as a set of reasonable solutions. However, to achieve the LB goal of the server, the best solution must be found among these reasonable solutions to ensure that the server has a good LB. Therefore, this article also gives an additional limitation. For all physical servers s_x, there are:

$$\frac{\sum_{v_x \in a_x} l'_x}{c_x} \leq G \tag{6}$$

The variable in Formula (6) is a supplementary variable in this article, which represents the maximum resource utilization rate $(0 \le G \le 1)$ in the physical server. From the perspective of constraints, the resource utilization of all physical servers is less than G. The purpose is to find a minimum variable. Under this condition, when the load of the physical server is not balanced, the computer can obtain a more balanced load state by transferring the largest physical server.

According to the algorithm idea, this paper designs the simulation system, and its overall architecture is shown in Figure 3:

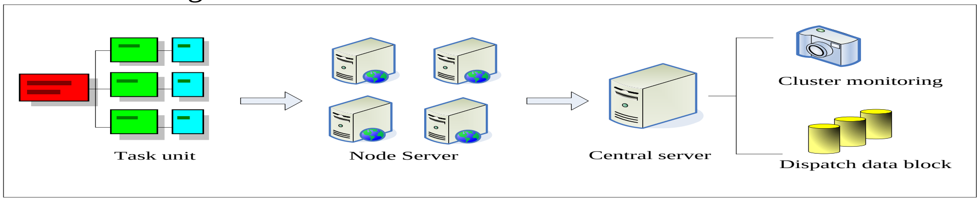


Figure 3: Overall framework of simulation system

(1) Task unit

The basic functional requirements of the computer virtual LB simulation system are to realize the dynamic simulation of data information and timely respond to multiple concurrent task requests. Its overall operation can be seen as a process of processing multiple concurrent task requests. In order to realize the LB of the computer, the task units in the system must be partitioned. The task unit is the smallest unit in the system task processing process, and its overall structure is shown in Figure 4:

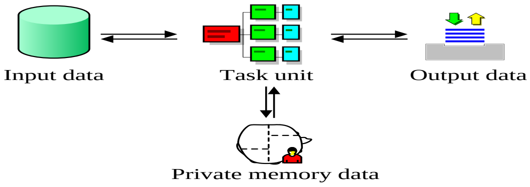


Figure 4: Legend of task unit

(2) Node server

The node server is a main hardware architecture of the simulation system. It is a unit composed of multiple nodes. Each server carries 42 nodes, ans each node is connected by a network. Load simulation is completed under a unified scheduling and management. Under the cloud computing architecture, node servers can be dynamically expanded. In the case of heavy load, the system can reduce the load of the system by expanding the node server. When the node server fails, it can also transfer the task units it carries to other nodes to ensure the stable operation of the computer.

(3) Central server

In order to reduce the additional communication cost and implementation difficulty caused by the cooperation of each node, this paper proposed to use a central server to coordinate the servers of each node. The central server received load from each node server regularly, and analyzed and processed it to ensure the overall load of the system. When the system load is unbalanced, the task request is transmitted to the load node with higher processing capacity according to the LB strategy to ensure the balance of the computer. On the central server, the operation of the entire simulation system can be obtained in real time through the centralized monitoring and scheduling data module.

2.3 System Implementation

(1) Operating System

A virtual machine environment is an environment that simulates physical hosts. In order for a virtual machine to become an effective service device, it is necessary to have a highly available service system. The operating system is a program that manages host software and hardware resources, processes, and file systems. It is also the foundation for the implementation of computer virtual load balancing simulation system functions. Starting from practical needs, performance, and operability, this article uses the Microsoft Windows operating system as the server operating system for this article. The open-source Windows 10 is one of the distribution versions of the Microsoft Windows operating system, which has high stability and intelligence.

2) Virtual operating environment

In computer virtual load balancing simulation systems, most of the running applications are provided by third-party developers, which cannot guarantee the security and stability of the system. To enhance the security of the system in the operating environment, it is necessary to "isolate" the system. This article separates multiple different service applications into multiple independent sandboxes in a constrained dynamic operating environment, ensuring the independence and security between nodes, and solving the problem of node failure.

(3) Application running environment

The role of an application server is to run applications, analyze web programming languages, and respond to user requests. This article uses Apache HTTP Server to implement it. Apache HTTP Server is an open source network server that can be used to deploy and run various network applications. The system provides various functions such as load balancing and reverse proxy, which can adapt well to the deployment and operation environment of business.

3. Computer Virtual Load Balancing Simulation System Test

To verify the effectiveness of the computer virtual load balancing simulation system under cloud computing architecture, this paper tested it from three dimensions: task scheduling, response time and load standard deviation. In order to highlight the application value of the system, this paper compared the test results with those of traditional simulation systems. The experimental environment is shown in Table 1:

Table 1: Experimental environment information

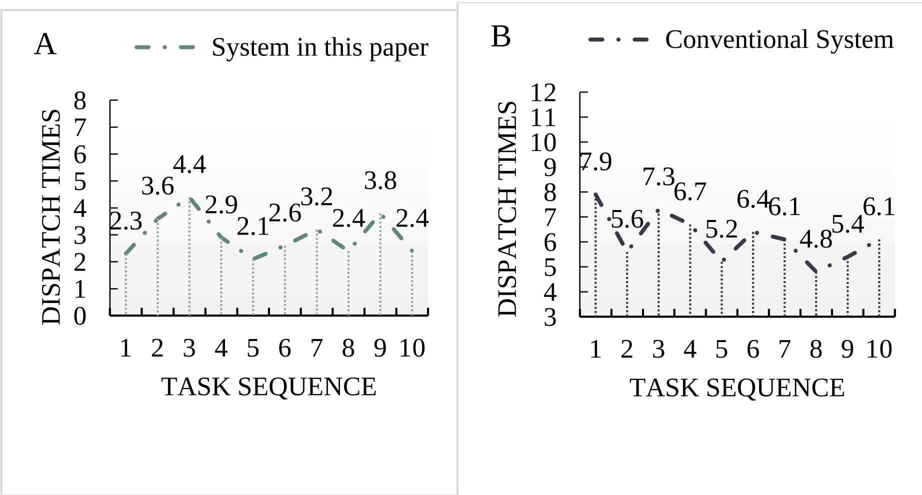
Attribute	Item	Specifications
Hardware	Central Processing Unit	Intel Core i7 7700
	Memory	8G
	Hard disk	1TB
	Video card	Pentium4 630
Software	Operating system	Windows 10

In the experimental environment, this article tested the computer virtual load balancing simulation system under the cloud computing architecture. Among them, the task scheduling test takes random tasks as samples, mainly comparing and analyzing the task scheduling times of the system in this paper and the traditional system; Response time testing mainly compares the time spent by random nodes responding to 1000 concurrent tasks to verify system efficiency; The load standard deviation test calculates the load balance of the system under different operating times.

(1) Task scheduling

In the computer virtual LB simulation system, task scheduling plays a vital role in the system operation efficiency. Because the simulation system adopts a cluster structure, each node needs to undertake a group of virtual load tasks. When the communication bandwidth between nodes is limited, how to achieve the minimum task scheduling times and ensure that the task resources of each node are reasonably allocated is an important indicator of system performance. In this paper, the average scheduling times of the two types of systems were counted through random task settings (1-10). The results are shown in Figure 5:

When the communication bandwidth between nodes is limited, how to achieve the minimum task scheduling times and ensure that the task resources of each node are reasonably allocated is an important indicator of system performance. In this paper, the average scheduling times of the two types of systems are counted through random task settings (1-10). The results are shown in Figure 5:



A: Times of system scheduling in this paper B: Dispatching times of traditional system

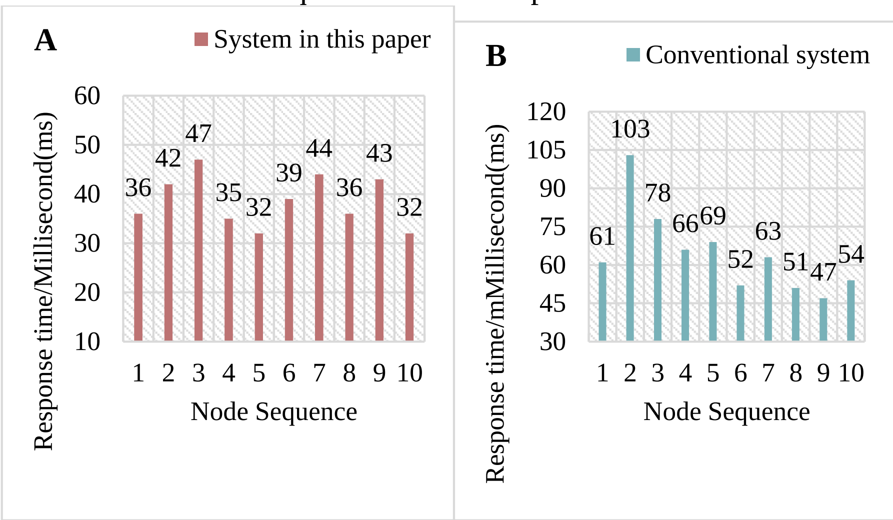
Figure 5: Task scheduling times

The fewer the task scheduling times of the simulation system, the higher the execution efficiency, and the better the LB effect. In Figure 5, it can be seen that there was a certain gap between the task scheduling of the two types of systems, and the scheduling times of this system were generally low. In Figure 5A, the scheduling times of 10 types of random tasks reached 2.3, 3.6, 4.4, 2.9, 2.1, 2.6, 3.2, 2.4, 3.8 and 2.4 respectively, with the lowest scheduling times of 2.1 and the average scheduling times of about 3.0. In Figure 5B, the scheduling times of 10 types of random tasks under the traditional system were 7.9, 5.6, 7.3, 6.7, 5.2, 6.4, 6.1, 4.8, 5.4 and 6.1, respectively. The minimum scheduling times were 4.8, and the average scheduling times were about 6.2. From the data point of view, the traditional system had more scheduling times, indicating that its network consumption was greater and the load information updated slowly. The computer virtual LB simulation system under cloud computing architecture can process different types of tasks more efficiently under the condition of consuming a small amount of network resources. It not only had great advantages in virtual LB, but also had high accuracy in task scheduling.

(2) Response time

In addition to the task scheduling times, the response time of the node server of the simulation system is also extremely important. The shorter the response time is, the faster the server responds and the more stable the system is. In this paper, 10 nodes were randomly selected from 42 nodes carried by two types of system node servers, and the time spent responding to 1000 concurrent tasks was counted. The results are shown in Figure 6.

In Figure 6, it can be seen that the response time of the system in this paper was shorter than that of the traditional system. In Figure 6A, the response time of 10 nodes to 1000 concurrent tasks was 36ms, 42ms, 47ms, 35ms, 32ms, 39ms, 44ms, 36ms, 43ms and 32ms respectively. It can be seen that the response time of 10 nodes was basically within the range of 30ms to 50ms, and the response time of each node was relatively short and centralized. In Figure 6B, the response time of 10 nodes to 1000 concurrent tasks was 61 ms, 103 ms, 78 ms, 66 ms, 69 ms, 52 ms, 63 ms, 51 ms, 47 ms and 54 ms respectively. The response time of each node ranged from 40 ms to 110 ms. The response time of each node was long and scattered. From the results, the traditional simulation system was difficult to deal with a large number of concurrent tasks, and the system stability was weak. The computer virtual LB simulation system under cloud computing architecture can well adapt to different application environments, and can achieve fast response time through hierarchical processing. Each node can respond to concurrent tasks quickly and effectively, and the system had strong stability, which can meet the requirements of computer virtual LB.

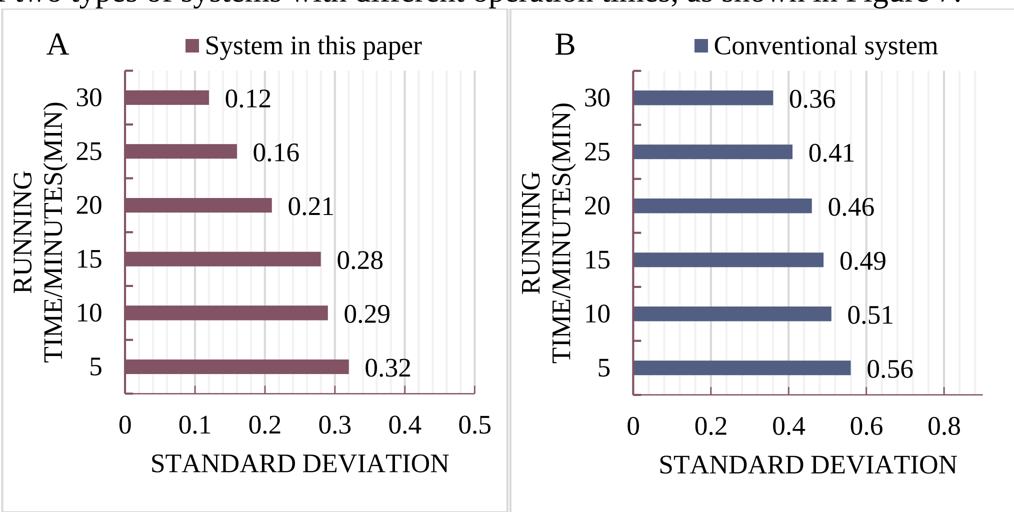


A: System response time B: Traditional system response time

Figure 6: Response time

(3) Standard deviation of load

Load Standard Deviation (SD) refers to the standard difference of resource utilization of the central server or memory of the system at a specific point in time. SD can reflect the dispersion of the load data set of the simulation system. The smaller its value is, the higher the LB degree of the system is. A higher LB degree can ensure that the load is maintained within the effective server operating range, so as to avoid excessive load and low load of the server. This paper calculated the load SD of two types of systems with different operation times, as shown in Figure 7:



A: System load SD B: Traditional system load SD

Figure 7: Standard deviation of load

It can be seen from the load SD results in Figure 7 that the load SD of both types of systems would decrease with the increase of running time. When the operation time reached 30 min, compared with the initial stage of operation, the SD results of both systems decreased. However, there were some differences between the specific results of the two systems. In Figure 7A, the load SD of the system in this paper was 0.32, 0.29, 0.28, 0.21, 0.16 and 0.12 respectively under different operation times. In Figure 7B, the load SD of the traditional system under different operation times was 0.56, 0.51, 0.49, 0.46, 0.41 and 0.36 respectively. From the specific SD results, the load data distribution of the computer virtual LB simulation system under the cloud computing architecture was relatively centralized, which meant that the balance of its central server or memory was strong, and the migration decision judgment was more accurate, which can effectively reduce unnecessary migration operations, so that the internal operation of the simulation system can reach a better state.

To verify the risk of system overload, this article combined the load SD results and conducted statistical analysis on the load changes of two major systems running for 5 minutes and 30 minutes. Student's t test was used to analyze the differences in system load changes. The measurement data conforming to Normal distribution are expressed by mean ± standard deviation. When the P value is less than 0.05, it indicates that the data difference is significant. The results are shown in Table 2:

Table 2: Statistical analysis of load changes

System	Run for 5 minutes	Run for 30 minutes	t	P
The system of this paper	1.48±0.32	1.61±0.12	0.631	0.355
Traditional system	1.53±0.56	1.79±0.36	2.716	0.021

From Table 2, it can be seen that there is no significant difference in load changes between the system running for 5 minutes and 30 minutes, with a P-value of 0.355, greater than 0.05; The difference in load variation between traditional systems running for 5 minutes and running for 30 minutes, with a P-value of 0.021, is greater than 0.05, indicating a significant difference. From the statistical analysis results of load changes, it can be seen that the system load in this article is relatively balanced, and its overload risk is relatively small. However, traditional systems will generate larger loads with changes in operating time, and their overload risk is relatively high.

4. Discussion

In the simulation system testing of computer virtual load balancing under cloud computing architecture, this article verifies the system effectiveness from three dimensions: task scheduling, response time, and load standard deviation:

(1) Task scheduling of the system

From the task scheduling test of the system, it can be seen that compared to traditional computer virtual load balancing simulation systems, the system in this paper has fewer scheduling times. Under the cloud computing architecture, the system adopts distributed computing methods to respond and process submitted commands and requests. Distributed computing allocates and decomposes these commands and requests, and distributes them to multiple computers for processing, effectively reducing task scheduling times and saving network consumption.

(2) Response time of the system

From the response test results of the system, it can be seen that in the context of a large number of concurrent tasks, the system response time in this article is shorter. The computer virtual LB simulation system under the cloud computing architecture in this article can fully utilize the computing resources of multiple computers, summarize the calculation results of various parts together to form an overall calculation result, thereby improving response speed.

(3) Standard deviation of system load

At different operating stages, the load standard deviation results of the system in this article are smaller than those of traditional systems. Under the cloud computing architecture, the computer virtual LB simulation system can achieve predetermined goals, achieving balanced scheduling of access requests and scalable growth of allocated resources for applications, and achieving dynamic load balancing in the cluster.

5. Conclusions

In recent years, with the continuous expansion of computer network construction scale, the number of system data and task requests has doubled, and the role of virtual LB simulation system in data processing has also been enhanced. As an important part of network communication, computer virtual LB technology can effectively improve the communication quality between computer devices and between computers and the Internet. In order to give full play to its application value, this paper effectively designed and deeply studied the computer virtual LB simulation system based on cloud computing architecture. This not only improved the scheduling efficiency of the system tasks, enabled it to complete more tasks on the basis of consuming a small amount of resources, but also improved the node server response speed and system load balance to a certain extent, and enhanced the stability and practicality of the simulation system. Although the computer virtual load balancing simulation system under the cloud computing architecture of this paper has made some achievements, there are still many areas worthy of improvement in the research process. The feasibility study of this system was only conducted during testing, and the actual effectiveness of this method cannot be evaluated during the experimental testing phase. Further verification of the system's compressive strength, reliability, and other aspects in a large-scale environment is needed, and more reasonable parameters need to be formulated based on the actual situation. In the subsequent research, people would improve the problems in this paper and constantly improve the scientific nature of the simulation system to promote the intelligent development of enterprise data management.

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