The Application of English Teaching Based on Cloud Network with Virtual Machine Technology

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Abstract. The research and practice of virtual machine technology in English teaching is in its infancy, research involving the production and use of the teaching courseware, the use of existing educational software, and the use of computer networks classrooms, the campus network, the Internet and distance learning utility. These research and practice indicates the trend of the future development of foreign language teaching. This article focuses on the discusses of the popularity of cloud computing and virtual machine instruction, by introducing the technology of VMware virtualization to solve problems encountered in the process of teaching cloud computing, fully demonstrated the widely use of virtualization technology and its irreplaceable role .

Introduction

The development of information technology and computer applications has had a tremendous impact on foreign language teaching. Multimedia technology can be used to design a new process of teaching and interactive, personalized training methods , which tightly integrated English teachers' teaching process and students learning process, and prompting the English teachers to generate new ideas in teaching, promoting the teaching process of fundamental change, prompting the students to change the traditional passive learning style [1,2]. This paper aims to present their views on the problems encountered in the promotion process and teaching process, through traditional and relatively mature virtualization technology to solve problems encountered in teaching "cloud computing" [3]. In fact, this is also a kind of cloud computing solutions, more specifically, an application of virtualization technology, a combination of virtualization technology and teaching application of cloud computing, a platform to promote cloud computing with VMware technology built.

Advantage of virtual machine

Convenient and safe use of a computer through the virtual machine to install more than one operating system to learn; portability of software test platform migration process; develop cross-platform system software for cross-platform testing. For example, mission-critical Windows and Linux-based [4,5] application development, virtual machines can take advantage of cross-platform development. The use of virtual machines in a computer at the same time enables multiple clients connected into a network, completely realistic simulated environment for testing or learning. Noting that virtualization is the logical representation of resource.

Cloud computing introduction

Although very young, cloud computing has become a broader application of technology, and various cloud emerging in the IT sector, some analysts believe that cloud computing represents a change in the way of enterprise computing. Expected that over the next five years, many giant manufacturers around the world, such as IBM, Dell, and Hewlett-Packard will transfer its own product line to cloud computing. With more and more enterprises turning to cloud computing, the traditional CPU chip chase higher performance, the pursuit of more large-scale supercomputers tirelessly to improve the performance of a single system industry development model will be slowly

replacing. Cloud computing course, have great vitality and represent the future direction of development of the IT industry, on behalf of the people's target in the IT industry, but this is also need to spread cloud computing in teaching which not only needs to implement a solid theoretical foundation for students, but also requires a combination of practice and more experimental, and a deep understanding of cloud computing.

PM-LB algorithm for virtual machine deployment based on the performance of vector

The study of deployment algorithm should fully considering the cloud computing's multi-user and multi-service environment, the reason is that the system is based on a virtual machine hosted business whose dependence is different for different resources, mainly dependent on the performance of the virtual machine as a user preference for performance and making resource allocation is given adequate resources to reserve space, the side of the user is designed to obtain a better user experience, admittedly. When dealing with the virtual machine deployment, we need first to effectively monitor the performance of the virtual machines. For that the virtual machine hardware resources generally consist primarily of CPU performance, memory utilization, network connectivity and configuration state of the virtual machine on the host operating status, etc. Standardization of performance characteristics herein by reference Virtual Machine Manager 2008 technical report performance evaluation criteria for the physical servers , the four basic performance of the CPU, memory, substitution, and a hard disk , for example, per 10min to extract the average value of the condition of use , according to resource characteristics calculated under treatment:

$$CPU \text{ characteristic}=1-\frac{CPU \text{ } Has \text{ } usaged}{(CPU \text{ } total-CPU \text{ } preserved)}$$

$$Memory \text{ characteristic} =1-\frac{Memory \text{ } Has \text{ } usaged}{(Memory \text{ } total-Memory \text{ } preserved)}$$

$$Bandwidth \text{ characteristic}=1-\frac{bandwidth \text{ } Has \text{ } usaged}{(bandwidth \text{ } total-bandwidth \text{ } preserved)}$$

$$Hard\_Disk \text{ characteristic} =1-\frac{Hard\_Disk \text{ } Has \text{ } usaged}{(Hard\_Disk \text{ } total-Hard\_Disk \text{ } preserved)}$$

When we analyze the standardized processing of all servers in the server pool through performance monitoring results, we are able to establish a performance vector $(q1, q2, ... , qi)$: in which, qi stands for the server i that personality can be characterized, i used to describe the overall performance of the virtual machine hardware indicator number. The UUID of the composition of all servers of the server pool vector $U = (u1, u2, un)T$, wherein n represents the physical number of servers. UUID of the pool of the entire server can be established with a corresponding performance vector become a performance matrix like Key / Value mode, as shown in Equation (1) below:

$$Q =[U \quad V]=\begin{bmatrix} u_1 & q_{11} & q_{12} & \cdots & q_{1l} \\ . & . & . & & . \\ . & . & . & & . \\ . & . & . & & . \\ u_n & q_{n1} & q_{n2} & \cdots & q_{nl} \end{bmatrix} \qquad (1)$$

Among them, the matrix each row represents a physical server performance vector, qij stands for the j row of server ui which is personality characterized.

$$E_{best} = \underset{i=1}{\overset{m}{MAX}} (\frac{\eta r_i}{\gamma s_i}) \qquad (2)$$

PM-LB server discovery algorithm first calculates the best match for a single virtual machine and physical server performance, then calculate the system load balancing and a comprehensive analysis of the above two calculations to arrive at a final server selection results. Its main body of algorithm can be divided into the following three parts.

(1) The match vector calculation

The difference between the performance characteristics of each physical server and virtual machines to be deployed performance expectations, called the server to be deployed virtual machine to a performance match $\Delta q_{ij} = q_{ij} - e_{ij}$.

$$\Delta Q = [U \quad Q - E_1] = [U \quad \Delta Q_1] = \begin{bmatrix} u_1 & \Delta q_{11} & \Delta q_{12} & ... & \Delta q_{1l} \\ . & . & . & & . \\ . & . & . & & . \\ . & . & . & & . \\ u_n & \Delta q_{n1} & \Delta q_{n2} & ... & \Delta q_{nl} \end{bmatrix} \quad (3)$$

When the matrix is obtained, each line is negative. However, this performance cannot meet the needs of a virtual machine, which will be considered as the unsatisfiable node removed from the matrix. Finally.)

$$S = \Delta Q'_1 * (w_1, w_2, ..., w_l)^T = (s_1, s_2, ..., s_m)^T \quad (4)$$

In the weight vector, the performance characteristics of the user's preference is given a smaller weight value, which is the order during the distance computing reduce their constraints, that also can enable the server to a greater performance space reserved for preference characterized.

(2) The match vector load vector comprehensive analysis

As mentioned before, Si is non-negative, the smaller the value the higher the matching degree, and the more suitable for deployment of the virtual machines on this server. Ri is negative description of the load is too large and should not be re- deploy virtual machines, but if all servers ri are negative, the absolute value of the smaller more suitable for the deployment of virtual machines, when ri is positive, the greater its value The remaining performance space for the larger, more suitable for deployment of virtual machines. Thus, a comprehensive analysis of the formula (5) below:

$$E_{best} = \overset{m}{\underset{i=1}{MAX}} (\frac{\eta r_i}{\gamma s_i}) \quad (5)$$

Analyses and Verification

After the completion of CloudSim extensible compiler simulation program experiment simulation, we are able to verity the experiment by two parameters that can be used to compare the performance of the algorithm. Using a simulation program to simulate a 40 - server (Host) data center, using the algorithm of this article, adding 10,15,20,30,40,50 virtual machine (VM) scene , then output Nact and DLB.
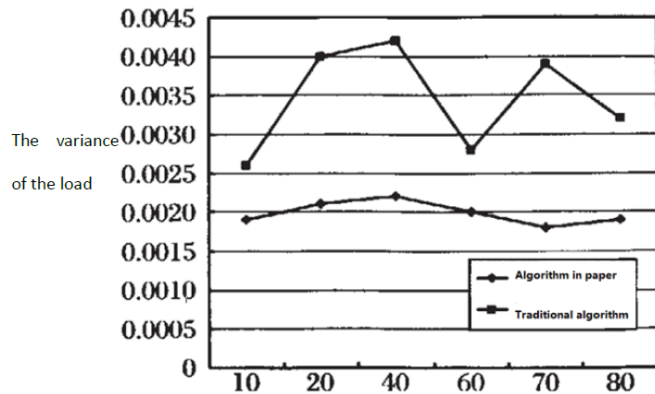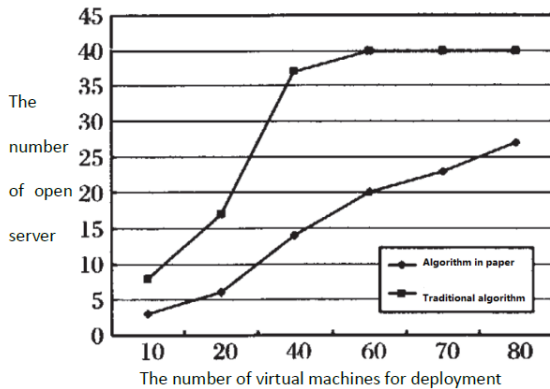

Fig. 2 Comparison for the number of opened server Fig. 3 Comparison of open server load variance

Experimental results can be verified that: PM- LB algorithm can greatly reduce the system server open shoulders quantity thereby reducing the cost of system resources. At the same time, it is able to remain stable in the lower range of the system load to achieve good load effect. Thus, it can

be concluded that the proposed algorithm can satisfy the cloud computing environment as well as the virtual machine deployment for resource usage and system load demand.

Conclusion

In the process of English teaching, multimedia-aided teaching has been popularized, however the limitations of the traditional algorithm still exist. To improve the teaching methods, this paper introduces a cloud computing system based on the virtual machine. In this paper, the initial deployment of a virtual machine programs and algorithms is also proposed. First, the paper introduced abstraction for physical server and virtual machine performance vector, after the performance-based vectors, respectively, calculated performance matching the judge vector and load balancing judgment vector. With comprehensive operation to get the final deployment of the results by the two vectors. Proved through experiments and analysis, the algorithm are able to solve the problem of the cloud computing system load balancing virtual machine deployment environment with the saving of resources..

Reference

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