- Conducting studies that include building and designing training programs that help teachers employ modern educational technologies.

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ASOFTWARE TOOL FOR BALANCING AND ENERGY CONSUMPTION IN A CLOUD COMPUTING NETWORK

Hind Ayad Majeed Alkakjea

Ministry of Education, Iraqi, Kirkuk

Scientific Supervisor – **Osman Nuri Uçan**

(Ph.D., Professor of the Department of "Electrical and Computer Engineering" Faculty of Engineering and Natural Sciences, Altinbas University of Turkey)

Abstract: In this study report, in recent years, cloud computing has emerged and is a platform for many institutions through its scalability and flexibility. The purpose of this research is VM migration by migrating the system and reducing energy consumption in addition to using software and load balancing technology in an equal and optimal way. In this particular instance. An approach to balancing virtual machines in cloud computing networks that is based on virtual machine migration is given and examined in this paper by employing the MATLAB software for the analysis purpose.

Key words: virtual machine, load balancing, Matlab, cloud computing.

Introduction

Cloud computing is the on-demand availability of computer system resources, especially data storage (cloud storage) and computing power [1]. The user used the MATLAB simulation program to achieve load balancing when consuming power for virtual machines without direct active management. Large clouds often have jobs distributed over multiple sites, with each site acting as a data centre [2]. Cloud computing relies on sharing resources to achieve cohesion and usually uses a "pay-as-you-go" model. The goal is to help reduce capital expenditures but may also lead to unexpected operating expenses for users. This task seeks to stimulate an optimal algorithm on the "Cloud-Sim" simulator and contrast it with further algorithms based on the distinct matrices like the make span (tasks finishing time) and the energy exhaustions on the cloud computing.

Results and discussion

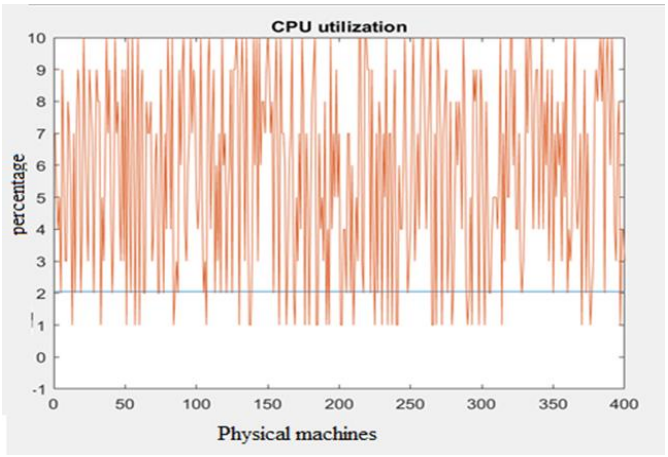
MATLAB software is introduced to achieve and facilitate the complex process for the main parameters of CPU, memory, and bandwidth utilization. These coefficients are widely used, especially in cloud computing, and can be executed with m files. The proposed method with the performed results is mentioned below with the programming code and utilization of coefficients According to the validations of coefficients, the number of physical machines is represented by the horizontal axis, while the rate of utilization is represented by the vertical axis. It can be observed that CUR, MUR and NBUR are initially unequally distributed. However, balance is achieved for the three values, after series of load balancing. The process of load balancing is discontinued when the load difference of each node is below 20% with 50 number for physical machine 1000,1800,2600,3000 CPU capacity for each physical machine 1,2,4,8 Memory value of a physical machine and 500, 700, 1000 to bandwidth values for overall physical machine when set 200 number for virtual machine, fig 1.

```
    mem2 = [mem2 mem_b2];


    nbu = BWRange(i) * BWUtil(i);
    D(i,3) = nbu;
    if(BWUtil(i) >high_thresh_bw)
        if(D(i,3)> (BWUtil(i)+adaptive_thresh_bw))
            bw_b1 = (low_thresh_bw + adaptive_thresh_bw);
            bw_b2 = (adaptive_thresh_bw + high_thresh_bw);
        end
    end
    if(D(i,3)>high_thresh_bw)
        bw_b1 = (low_thresh_bw + adaptive_thresh_bw);
        bw_b2 = (adaptive_thresh_bw + high_thresh_bw);
    end
%     disp('bw_overload_device_' +int2str(i))
%     disp('bw_b1= '+int2str(bw_b1))
%     disp('bw_b2= '+int2str(bw_b2))
    bw1 = [bw1 bw_b1];
    bw2 = [bw2 bw_b2];

end
```

a



b

Fig 1. Bandwidth and Memory Utilization Equations with MATLAB Code

In response to the exponential expansion in the number of cloud service customers, there has been a proportionate increase in the demand for greater data processing capacity [1]. In this case, the goal of cloud service providers is profit-making, but the purpose of customers is to benefit from characteristics such as faster and more consistent service delivery. All of these demands place a significant strain on the cloud data centres' capacity and resources [2]. As a result, there is the possibility of resource underutilization or undersupply. As a result, load balancing in the cloud data centre is an important consideration. This study examined the load balancing in cloud computing based on virtual migration, including how load data may be gathered, what types of load data can be used, and how to identify the virtual machines that are the source and target of the virtual migration [3]. Load balancing is important in a cloud system to balance storage, on-demand service, and the data centre. Help achieve a minimum of server overheads and a maximum of resources. Reducing the migration time for each of the three different, CPU, MEMORY, BW, and its ratio with physical machines. Get better performance and efficiency by using the effective algorithm through execution time and percentage CPU, MEMORY, and BW utilization.

Conclusion

In conclusion, the exponential expansion in cloud service customers has increased need for additional data processing. The purpose of cloud service providers is to make money, whereas consumers want faster and more dependable service. This study examined how to gather load data, how to use it, and how to identify the virtual machines' source and destination in cloud computing. To overcome the problem of unnecessary weight, a target virtual machine was developed. Finally, the study conducted various tests to prove the algorithm's efficiency. This study also shed light on how consensus techniques might function with distributed resources.

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