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A Study on Spatial-Temporal Load Balancing Approach in Cloud Computing

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***Abstract*—** The main aim of this research paper is to study the spatial-temporal load balancing method and its efficiency of load balancing in cloud computing environment. This paper discusses the methods such as the singular structure and algorithms for unified spatial and temporal load balancing. A novel spatial-temporal load balancing approach that exploits both the geographic and temporal variant of power rate to cope with this trouble. To our best understanding, that is the primary strategy that takes a systematic, unified spatial and temporal load scheduling method in this topic.Rigorous evaluation and tremendous reviews based totally on actuallife statistics exhibit that the proposed spatial-temporal load balancing method can substantially schedule work and assure a provider of completion time for person requests.

***Keywords*—** Cloud computing,spatial-temporal load balancing, cloud computing, unified spatial and temporal approach, algorithms, etc.

I. INTRODUCTION

Cloud computing is a new way of utilizing the virtual resources. It is not a new technology but a new method.Cloud computing is a dispensed computing version which allows customers to lease sources from the cloud provider.Load balancing includes the methods to find the overloaded nodes and transferring the extra load to other loads. In a cloud environment, more than one cloud users request is based at the on-demand resource provisioning with a pay-consistent with-utilization price model [1]. Hence it's far supported by infrastructure called net records center. Cloud load balancing is the technique of dispensing workloads transversely multiple compute resources. Many components should be considered and used to attain the maximum performance in the cloud environment rather than a single component in the network. Many load balancing algorithms are proposed in order to resource allocation and efficient scheduling to reduce the over utilization and under utilization of virtual machines, CPU, and Memory [2]. This research paper proposes a singular structure and algorithms for unified spatial and temporal load balancing and optimal scheduling algorithm. The rigorous evaluation shows that our algorithms have a low computational complexity, require an at ease accuracy in electricity charge estimation, and guarantee a provider final touch time for person requests. The proposed spatial-temporal load balancing technique drastically reduces power value for dispensed IDCs.

Advantages of Cloud:
Services according to the requirements.
Easy accessibility based on the needs through the networks.
Pay and use model.
Possibility to increase and decrease the resources in the cloud-Elasticity .
Resource pooling [3].

II. RELATED WORK

Martin et al. (2010) proposed a distributed solutions based on the three algorithms such as Honeybee Foraging Behaviour, Biased Random Sampling, and Active Clustering [4].There are three loads are possible in the cloud computing. They are CPU, Memory and Network load. Kaur et al. (2012) discussed the various algorithms and its use in load balancing technique. They analyzed the algorithms and factors such as scalability, performance, better response time, better utilization, memory, etc[5]. Zenon et al. (2011), discussed static algorithms, dynamic algorithms, and their advantages. According to them static algorithms, divide the traffic equally between the servers. Whereas, dynamic algorithms, search the lightest server and divert the traffic to it. They also discussed the middleware and its applications in the distributed networks [6]. Neethu (2015) studied various algorithms such as Fuzzy based fireflyalgorithm, Honeybee inspired algorithm, Ant colony optimization algorithm, stochastic Hill climbing algorithm, Genetic algorithm, etc. to balance the load in cloud computing [7].

Types of Load Balancing algorithms: Based on the sender, load balancing algorithms in the cloud computing are classified into

1. Sender-initiated Based on the sender who initiates the process
2. Receiver initiated Based on the receiver who initiates the process
3. Symmetric Based on both sender and receiver initiation [8]

Dynamic load balancing algorithms do not consider the previous state of the system. It considers the present state of the system. James et al. proposed an algorithm named Weighted Active Monitoring Load Balancing Algorithm. It assigns weight to each node and then performs according to them [9].Yiqiu Fang et al.(2010), proposed an algorithm named efficient task scheduling to reduce the overload among the virtual machines in the cloud environment. It worked well to reduce the load and high resource utilization in the cloud environment [10]. Meenakshi et al, (2012), proposed a new algorithm to enhance the performance in the cloud environment. They tabulated the overall response time and also stated the cost wise benefits of the methodology. They compared the algorithms such as throttled and active monitoring VM load balancer, etc [11] Clusters give the chance to distribute the load through various computers in the networks. If one computer is overloaded it will affect the overall network in the cloud environment. [12]. Mirrored databases in clusters technique reduce the chances of outages. If one system is overloaded, the load balancer is able to change the load into another available virtual machine [13].

III. OBJECTIVES OF THIS STUDY

In order to enhance the cloud computing performance, we need to reduce the task scheduling time to a minimum fraction of seconds and also to minimize the time dedicated for communication and synchronization among the virtual machines. The main objective of this research paper is to propose a singular structure and algorithms for unified spatial and temporal load balancing and optimal scheduling algorithm.

IV. SCOPE OF THE STUDY

Cloud computing is one of the fast developing areas of the computer research. There are many possibilities to solve the issues related to end-user satisfaction and performance. Establishment of effective load balancing technique has many significant impacts on the issues such as internet of services, fault tolerance, scalability, availability, etc., Effective distribution to all the virtual machines through a secured network is the main research area need to be addressed in the area of cloud computing. Even though many technological related issues such as data integrity, data recovery, data privacy, networks, operating systems, virtualization, resource scheduling, concurrency control and memory management, etc. are present in cloud computing cloud computing has tremendous scope in terms of research. Through the secured network, distributing data to the receivers with load balancing technique enhances the user experience. Enhancing the performance of the virtual machines, memory allocation, scheduling, availability, etc, has many scopes in network related research works. There are possibilities to minimize the DDoS (Distributed Denial of Service) attacks in the networks which have the possibilities to reduce the performance.

V. CONCLUSION

In this research how to leverage both the geographic and temporal variation of data price to minimize cost for distributed IDCs in deregulated data server. A novel architecture and two algorithms for unified spatial and temporal load balancing in distributed IDCs. The rigorous analysis shows that our proposed algorithms have a low computational complexity, require a relaxed accuracy in data estimation, and guarantee a service completion time for user requests. Extensive evaluations demonstrate that the proposed spatial-temporal load balancing and optimal scheduling method achieves significant energy cost saving compared to the schemes utilizing spatial load balancing or temporal load balancing alone.

REFERENCES

[1] M. Armbrust, A. Fox, R. Griffith, A. D. Joseph, R. Katz, A. Konwinski, G. Lee, D. Patterson, A. Rabkin, I. Stoica, and M. Zaharia, "A view of cloud computing," Commun. ACM, vol. 53, pp. 50–58, April 2010.

[2] J. Hamilton, "Cooperative expendable micro-slice servers (cems): Low cost, low power servers for internet-scale services," Jan. 2009

[3] J. Hamilton, "Cooperative expendable micro-slice servers (cems): Low cost, low power servers for internet-scale services," Jan. 2009

[4] Martin et al. "A comparative study of distributed load balancing algorithms for cloud computing:", IEEE Xplore, 2010

[5] Kaur, Rajwinder, and PawanLuthra. "Load balancing in cloud computing." *Second Symposium on Cloud computing*, ACEEE, 2012.

[6] Zenon et al, "Availability in load balancing in cloud computing", International conference computer on software and modeling", LACSIT press, Singapore 2011.

[7] Neethu, "Load balancing in cloud computing", International conference on recent innovations science, engineering and management", Delhi, 2015

[8] Ramprasad. "Load balancing in cloud computing",B.Tech Thesis submitted to NIT. Roorkela, 2011

[9] James et al. "Efficient VM load balancing algorithm for cloud computing",International journal of CS and engineering, ProQuest, 2012

[10] Yiqiu et al. "A Task Scheduling Algorithm Based on Load Balancing in Cloud Computing" Springer, 2010

[11] M. Sharma et al. "Efficeincett load balancing algorithms in VM cloud environment", IJCST, 20112.

[12] R.l. Charter et al. " Resource allocation in distributed computing environment", digital avionics system conference, IEEE/SAE, 1998 Page No;1-8

[13] D. Durkee, "Why cloud computing will never be free", Queue, Volume 8, page 20-29, 2010.

