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An Efficient and modified Load Balancing Method for Cloud Computing

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ABSTRACT: Now a day's Cloud Computing provides lots of services with cheaper price and pay as per use fundamental. As the lots of users work in cloud environment so all the data center consume lots of power. The host available on server is loaded with many users' processes. The load of host are not distributed uniformly that's why some host loaded heavily and some have very less user process to execute. This type of distribution decreases performance of data center as well some time a new user's process not get proper host/VM for their new process. Selection of proper Host as well placement using proper Host gives opportunity to balance load properly among multiple host. In this research, we intend to study various VM placements & selection policies and VM migration algorithms for over loaded and underloaded hosts for Load balancing which also reduce energy consumption. We intend to use best among the different method for Load balancing for placing user process on VM of the host based on utilization thresholds. Other side When multi data center available then even its become difficult for the user to choose best among them. From the basic analysis we can say that in cloud computing environment load balancing is required distribute the dynamic local workload evenly between all the host using proper techniques so that user can have better choice to put their new request on nearest data center.

KEYWORDS: cloud computing, load balancing, energy consumption, VM migration, VM placement

I. INTRODUCTION

Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.

Key parameters of Cloud computing

- 1. Fault tolerance:**
When fault enters in to the system we have to apply fault tolerance methods. Fault tolerance used to forecast failure and then take appropriate action which includes failure recovery, lower cost, and improved performance metrics.
- 2. Load balancing:**
Load balancing is used to optimize resource usage, decrease response time, increase throughput and avoid overload at single resource. Which is done by diving work of a single computer between more than one computer.
- 3. Power Saving:**
Ideal power wasted When server run at low utilization which is major cause of more energy consumption. In the Cloud computing multiple data hub applications are hosted on a universal set of servers. This allows for pooling of application workloads on a smaller number of servers that may be kept improved utilized, as different workloads may have different resource use. Pooling thus allows amortizing the idle power costs more efficiently.
- 4. Hardware Maintenance:**
Because application need not be installed on each computer maintenance of Cloud computing is easier. Application can be accessed from different location.



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Load balancing

Load balancing is a technique to allocate tasks across two or more computers, network, links, CPUs, hard drive or other resources. Load balancing is used to distributing a bigger processing load to smaller processing nodes for enhancing the overall performance of system. In cloud computing environment load balancing is required distribute the dynamic local workload evenly between all the nodes.

Load balancing helps in fair distribution of resource to get a high User satisfaction and proper resource use. High resource use and Proper load balancing helps in minimizing resource use. It helps in implementing fail over, scalability, and avoiding bottlenecks.

II. RELATED WORK

Cao,Z et.al[1] In this paper they propose a novel VM allocation algorithm and VM selection improved algorithm Mean variance (EV)novel method for find over loaded host In this way author use safe parameters for determine overloaded host which is different from the other method. An improved policy from MC (MCE) method for VM Selection result illustrate that this algorithm attain high energy consumption but shorter SLA violation period and less VMs migration than the algorithm present in[6] they proposed a method for over utilized host and selection in dynamic VM consolidation. They introduce use the Median Absolute Deviation(MAD),Interquartile Range(IR),LR, Robust local Regression(LRR), Minimum Utilization(MU),Random choice(RC), MMT, Maximum correlation(MC) for overloaded host and selection of VM.

Huang, J et.al[3] proposed Dynamic VM consolidation algorithm which consider both server overutilization and underutilization. Energy utilization is modelled as the sum of execution energy communication energy during Vm migration and server switching energy. In allocation process LR method is used for find overloaded host. And MMT method is used for select one or more VMs from each overloaded host. also for the VM placement they used Best fit Host (BFH) & Best Fit VMs (BFV) methods.

Fu, X et.al[4] In this paper they dynamically set the limit in the overloaded host testing policy In this paper they propose Meets Performance (MP) method for VM selection based on the performance satisfaction and used Minimum correlation Coefficient (MCC) for VM Placement proposed novel VM selection and placement policy which consider degree of resource satisfaction and can reduce energy consumption, VM migration time and SLA violation.

Horri, A et.al[5] In this paper they used LR for overload detection, MMT for VM selection and proposed VM based Dynamic threshold (VDT) for find underloaded host also reduced number of migration and SLAV not only they consider past history of VMs to predict its future state but also consider number of VMs to determine underloaded host a novel QOS aware VMs consolidation approach is proposed that adopts a method based on resource utilization of virtual machine. The proposed algorithm significantly reduce number of VM migration.

Beloglazov, A et.al[6] have define the problem consume amount of electrical energy and carbon dioxide emissions using novel adaptive heuristics for dynamic consolidation of VMs based on an analysis of data from the resource usage by VMs. The proposed algorithm reduce energy consumption. Use the method for VM consolidation is 1) In host overloading uses MAD,IQR,LR,LRR 2)in VM selection uses MMT, RC, MC. 3)for determining underloaded hosts a simple approach is used. But those algorithm have failed to get short SLA violation period in each active host and small VMs migration in virtualized data center. To solve this problem they design a novel method for overloaded host and PABFD method for VM placement.

Cao, Z et.al [7] proposed a framework for VM consolidation. They also use many method for overloaded detection and VM selection. Then they proposed MInPower and MaxUtilization for VM placement based on MinPower Policy. So this result also better compare to MinPower policy.



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III. PROPOSED ALGORITHM

Algorithm

Step 1: Find host from hostList

Step 2: Using Novel EV method, check which host has been overloaded?

 If yes than go to next step

 Else go to step 4

Step 3: Using Meets (MP) method, find VMs from host for migrate
and add them into migrationList

Step 4: Check another host in hostList that not be checked?

 If yes then go to step 1

 Else go to next step

Step 5: Then add VMs into migrationList

Step 6: Again find a host from hostList

Step 7: Using Novel VM based dynamic threshold (VDT) method, Check host has been under loaded or not?

 If yes then go to next step

 Else go to step 10

Step 8: Find VMs of host for migrate and add them to migrationList

Step 9: Check another host in hostList that not be checked?

 If yes then go to step 6

 Else go to next step

Step 10: Using MCC method, Find new placement for VMs migrationList and add to migrationMap

Step 11: End

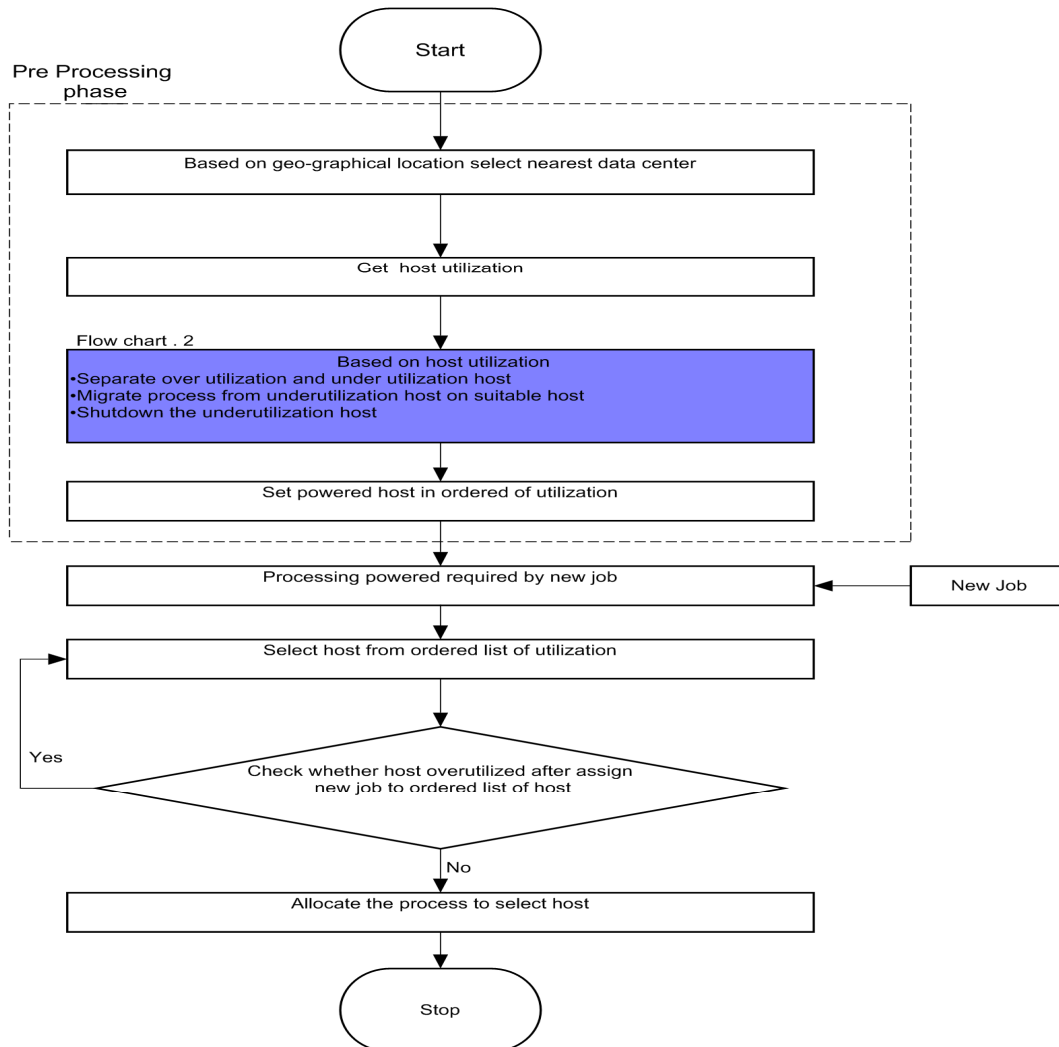
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Proposed Model 1.



In preprocessing phase first of all we select nearest data center based on the geographical location. Then get the host utilization Based on host utilization first we separate overloaded host and underloaded host after separate host we migrate process from underutilization host on suitable host and shutdown the underutilization host .then set the powered host in order of utilization After this process we enter a new job. A new job required a processing power then select a host from list of utilization after select the host check the host which we used is become over utilized after assign a new job. If a host is overload after assign new job then select another host from utilized list otherwise allocate the process to selected host.

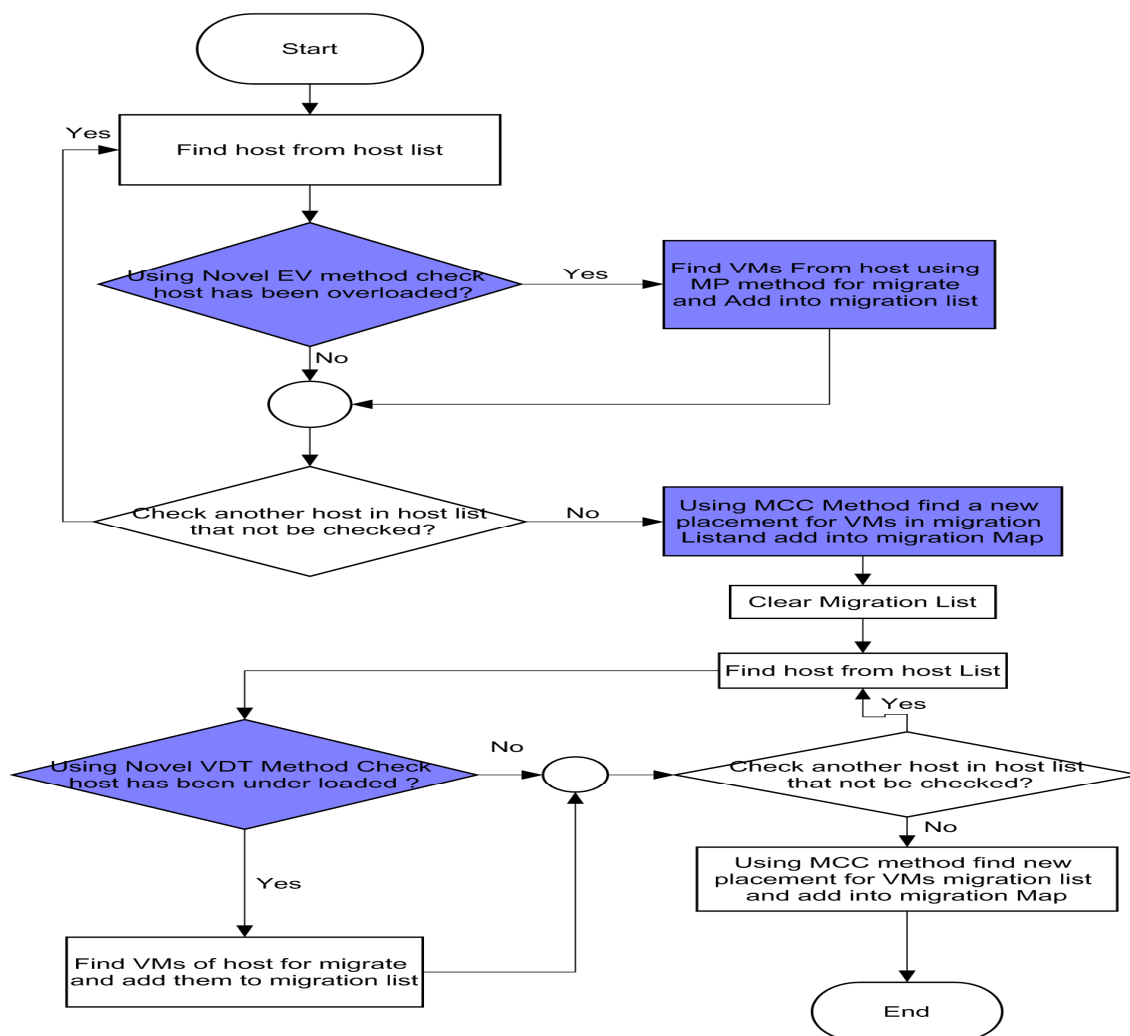
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Proposed Model 2



The above Figure show Proposed Method. There are four step is required. First find the total host from HostList, then after

1) A novel EV method used for determining which host are overloaded. when the host is overloaded then in the next phase 2) MP method used for selecting some VMs from overloaded hosts. In the next phase add the VMs into MigrationList and then find the host from HostList then 3) A novel VDT method used for determining which hosts are underloaded and selecting all VMs from them for migration. 4)At the end of the phase, MCC method is used for finding new implement for VMs.

By using the our proposed novel method we can distributed workload among all the nodes



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IV. CONCLUSION

Load balancing is the major issue in cloud computing environment. We referred a many research paper and we find that proper usage of VM selection and placement method may help reducing number of VM migration we have proposed a novel EV method for find overloaded host and also a novel VDT method for finding underloaded host. Using this method workload can be distributed among all the nodes also using this load balancing technique we can reduce the energy consumption.

REFERENCES

1. Cao, Z., Dong, S (2012). "Dynamic VM consolidation for energy aware and SLA violation reduction in cloud computing" in International Conference on Parallel and Distributed Computing, Application and Technology
2. Patel,M., Patel, H., Patel,N.,(2015). Workload consolidation using VM selection & placement techniques in cloud computing in International Journal of computer Application,137 (4), 0975-8887.
3. Huang, J., Wu, K., &Moh, M. (2014, July). Dynamic Virtual Machine migration algorithms using enhanced energy consumption model for green cloud data centers. In High Performance Computing & Simulation (HPCS), 2014 International Conference on (pp. 902-910). IEEE.
4. Fu, X., & Zhou, C. (2015). Virtual machine selection and placement for dynamic consolidation in Cloud computing environment. *Frontiers of Computer Science*, 9(2), 322-330
5. Horri, A., Mozafari, M. S., &Dastghaibifard, G. (2014). Novel resource allocation algorithms to performance and energy efficiency in cloud computing. *The Journal of Supercomputing*, 69(3), 1445-1461
6. Beloglazov, A., &Buyya, R. (2012). Optimal online deterministic algorithms and adaptive heuristics for energy and performance efficient dynamic consolidation of virtual machines in cloud data centers. *Concurrency and Computation: Practice and Experience*, 24(13), 1397-1420.
7. Cao, Z., & Dong, S. (2014). An energy-aware heuristic framework for virtual machine consolidation in cloud computing. *The Journal of Supercomputing*,69(1), 429-451.
8. Gupta,S., Tiwari, D., & Singh, S.(2015)"Energy efficient dynamic threshold based load balancing technique in cloud computing environment".*International journal of computer science and information technology*,6(2),1023-1026
9. Wadhwa,B., &Verma,A.,(2014)"Energy and carbon efficient VM placement and migration technique for green cloud database". *IEEE*,978(1),4799-5173-4
10. Arthi,T., &Shahul,H. (2013)"Energy aware cloud service provisioning approach for green computing environment". *IEEE*,978(1),4673-6150-7
11. Sadhu,R., &Vania,J.,(2014)"Survey on various load balancing techniques in cloud computing"., *International journal of science and research*,2319-7064