A Survey on Preference Based Resource Allocation Model for Cloud

Dr S.Thilagamani[1], T.Sangeetha[2]
[1]Dean and Professor, [2]PG scholar
Department of Computer Science and Engineering,
M.Kumarasamy college of Engineering, Karur.

Abstract-Now-a-days, Cloud computing plays a major role in day- to -day business activities. It is a kind of computing service used for giving out the resources to a certain extent than having local servers or personal devices to hold applications. Demand based preferential resource allocation technique is based on demand-supply scenario in the market to discover the users for resource allocation based on their amount capabilities and setup a payment policy based on the preferences chosen by the buyers as the Cloud Service Provider(CSP) offers. This technique provides resourceful provision, provides justice to the user and gives better returns to Cloud Service Provider (CSP). This technique is also capable of undergoing bid revisions when it exceeds the best bid payment. This survey paper helps to improve the energy efficiency of Virtual Machine (VM) by minimizing the number of VMs to be activated at a time.

Index terms: Cloud Service Provider, Virtual Machine, Resource Allocation

I. INTRODUCTION

Cloud Computing is one type of utility based computing which offers instant services to the cloud users. It is also called as "Pay-as-you-go" model or "Internet Computing". The main advantage of cloud computing is that it reduces the cost for renting the infrastructure from the Cloud Service Provider(CSP) and also offers a mechanism for the cloud users to access any service from anywhere at anytime with the help of internet.

In cloud computing, based on the resource usage, the cloud users have to make the payment according to that usage. Generally, resource allocation is a method of handing over the on-hand resources to the wanted users with the help of internet. The resources may be a hardware resource or a software resource. The resources can be requested through various parameters like processing, memory and the disk needs.

Virtualization technique also plays a significant role in cloud computing for running the multiple applications in a single server at a time. It also provides flexibility in managing their system and have a control over that system. It takes care about the energy efficiency of the data center and well suited for the private cloud when compared to the public cloud.

II. LITERATURE REVIEW

Thiago Kenji Okada et.al [1], a problem of energy efficient initial VM placement has been focused. In order to overcome this problem, three algorithms have been proposed. The aim of placing the requested VM on a host is to minimize the number of physical machines which is active by escalating the workload in the current active machine. In First Fit Decreasing algorithm, based on CPU usage the VMs are sorted in decreasing order and then processes the list in the FIFO order in which it fits. It proceeds subsequently to the VM until all VMs are allocated and it suspends idle physical hosts, to reduce power consumption. In Power Aware Best Fit Decreasing algorithm, after the allocation of current VM then it computes the raise in power consumption. In Global Power Aware Best Fit Decreasing algorithm, once simulate the allocation of VM in the current host later it calculates the power utilization of entire data-center. By comparing these three algorithms with other algorithm like DVFS, they consume less energy [1].

Jayshri Damodar Pagare et.al [2], Energy efficiency is measured as an significant issue in Cloud Computing platform. This can be achieved by using virtual machine consolidation. In this, it is mainly focused on introducing an efficient SLA-aware algorithm. In the data center, the host's status are based on three types. They are: Overload, Underload and Idle. Overload host is the one that might create violation of SLA, whereas Underload host is in use but does not generates SLA violation and Idle host is accessible but unoccupied. If the overload host does not create SLA violation, then it will consume more energy. To overcome this problem, VM consolidation algorithm had been proposed. Thus, it minimize the number of migrations of VM, SLA violation and energy consumption [2].

Beloglazov et.al [3], had defined the architecture, principles and algorithms for energy aware mapping of VMs. In this paper, the author had used the concept of dynamic consolidation of VM for partitioning the resources. The steps involved in this algorithm are VM placement, VM selection, migration policy minimization and higher potential growth policy. The basic design behind this algorithm is to set up the entry values for host and the total utilization of the CPU is calculated by means of allocating all VMs to the host between these entry values. The virtual machine with fixed threshold is not suitable for variable workload [3].

Narander Kumara et.al [4], had considered a market based method to categorize users for resource allocation based on their amount capability by implementing the payment policy based on preferences chosen by buyer as offered by Cloud Service Provider(CSP). The proposed resource allocation technique is a cyclic process where Cloud Service Provider (CSP) auctions cloud resources (VMs) to user and charge the user based on the quantity of resources used. The steps involved in this technique are Pre-auction, Market-driven Open auction and Preference-driven payment. The techniques used in this paper undergoes bid revisions, rebidding and multiple payment criterion for the cloud user But the author does not focused on energy efficiency of VM [4].

Ziqian Dong et.al [5], had proposed the Most-Efficient-Server-First (MESF) scheduling method in order to diminish the energy use of servers in datacenter. In this scheme, based on an integer programming problem the task is assigned to the server for minimizing the energy consumed by the servers of datacenter. In MESF scheme, it schedules the task to lowest number of servers by maintaining the datacenter response time in highest limitation. MESF reduces datacenter energy consumption 70 times than consumed by other schemes that assign the task randomly. The parameters used in this technique for evaluating the energy consumption are deadline of the task, requirements of the resource and energy profiles of the server. In this scheme, based on their energy efficiency central scheduler sorts the server and assign the tasks to the most energy efficient server initially on the list and so on. But the complexity in this scheme is that sorting the servers based on their energy efficiency. The advantage is that it lowers the average task response time and also the server interconnected energy utilization[5].

K.C.Gouda et.al [6], had presented the method for efficient resource allocation to achieve maximum profit by dropping the wastage of resources with the help of cloud owner. It is a very challenging issue in cloud to satisfy both the needs of the user's requirement as well as server's performance equally. Here ,Priority algorithm is used for deciding the priority among various user request based on the parameters such as type of the task, cost, time and amount of processors required to execute the task . The cloud administrator plays a key role in priority algorithm for deciding the priority among various user requests. Based on the parameters such as time, Processor request, Importance and Price as well as with some threshold attributes, Priority algorithm sets the priority among various tasks submitted by various users. The priority is based on FCFS basis [6].

Ankita Choundhary et.al [7], proposed a live migration technique for optimal placement of VM. The aim is to maximize the overall consumption of computing resources and to minimize the energy utilization of data-center. Energy efficient consumption of data center resources is categorized into two steps. Placing the VM in efficient manner is the foremost step and the next step is the resource optimization using live migration. The main objective of first step is to make best use of available resources and the goal of live VM migration is to transport the memory position of VM from one Physical Machine (PM) to another. By using live migration, energy efficiency can be improved. It is greatly efficient in resource consumption of a datacenter as well as energy reserves [7].

GhanshyamParmar et.al [8], had proposed Priority-Based Energy Optimized Scheduling Scheme (PEOSS) for energy optimization. The main objective of this technique is to diminish the energy consumption and improvement in the utilization of Virtual Machines (VMs).In this scheme, auto scheduler software manages all VMs request as per the request of the consumer in reservation or on-demand manner. For reserved instance, VMs are occupied not for one day and some hours of time, but for long period of days with specific time. In case of on-demand instance, VM is occupied at specific date and stipulated time. The consumer request is coming in FCFS manner but the assignment of VM to the request is based on the priority. The priority is based on each and every request of the consumer so that no one had to wait for VM. Using Request Management System (RMS), the requests are collected in queue, VMs are also in queue. Then PEOSS schedules the request to VM. This scheme is beneficial for the service providers who provide Platform-as-a-Service (PaaS) [8].

Kushang Parikh et.al [9], consider different attributes and different Service Level Agreement for balancing the variable workloads. It helps the cloud environment to make use of the resources and look up the performance of Virtual Machine (VM). Hungarian algorithm is used for distributing the job among VM with the purpose of providing high rate or fewer execution time to the complete task.VM allocation algorithm assigns the VM to the host of the datacenter which have free processing elements nearer to the quantity of processing elements essential for that VM. These two algorithms provide fair distribution of cloudlets between the VMs. Both algorithms are designed and computed using CloudSim simulation toolkit and identified the output. In outlook, this policy can be experimented by taking the space as a parameter with respect to load generated in cloud atmosphere [9].

K.R.Dillip et.al [10], profit maximization for multi-server configuration had been focused. The approach is to treat multi-server systems as a queuing model, to optimize the resource wastage shared to multi users. Here, picking up the optimal server size along with server speed is a difficult task. By escalating the amount of servers along with server speed also improves the cost for renting the infrastructure and also the price of energy expenditure. The scheduling mechanisms disused in this paper suit the goals of both parties [10].

Anton Beloglazov et.al [11], based on adaptive utilization threshold a new technique which meets the Service Level Agreements (SLA) and the energy efficient dynamic consolidation of Virtual Machines (VMs) had been introduced. The algorithm used for VM placement is Modified Best Fit Decreasing (MBFD) algorithm. In this paper, a new technique for automatic adjusting of utilization thresholds based on numerical investigation of historical records had been proposed which is collected for the period of life time of VMs and it delivers best energy utilization, violation of SLA and integer of VM migration

over special workload types. In upcoming, it is going to focus in multi-core CPU Architecture as well as compound system resource [11].

Weiji Shi et.al [12], proposed the foremost truthful online mechanism which provides revenue to the provider as well as the welfare of the social system. The first online combinatorial auction for dynamic cloud resource provisioning is RSMOA, which is the best auction mechanism related to performance metrics. RSMOA contains two components. Primarily it designs an online method based on the essential setting of the truthful property and subsequently it derives the significant pricing curve from a threat-based strategy. RSMOA achieves near-optimal performance in practical scenarios [12].

Young Choon Lee et.al [13], aims to maximize resource utilization of both lively and inactive tasks energy consumption. Without degrading the performance of the task, the proposed heuristics will assign the task to the resource for which its execution takes less energy. The expenditure function of ECTC calculates the real energy consumption of recent task .The price tag function of MaxUtil is computed with the average utilization during the processing time of the in progress task. By comparing the cost function of both MaxUtil and ECTC, MaxUtil cost function totally reduced the number of active resources and in this manner energy consumption is also reduced [13].

Chongjin Li et.al [14], had proposed dynamic energy efficient Virtual Machine (VM) migration technique which is based on multi-resource energy efficient model. It reduces the energy expenditure together with the Quality of Service (QoS) guarantee. Here , VM migration algorithm is considered to gratify the Service Level Agreement (SLA) and also to optimize the energy efficiency of the system. Steps to be passed out in this techniques are must understand that the selected VM should transfer. Atlast, Modified Particle Swarm Optimization (MPSO) method is introduced into VMs reallocation algorithm to diminish the energy consumption of entire system. By comparing with Modified Best Fit Decreasing (MBFD) algorithm, Modified Particle Swarm Optimization (MPSO) reduces the number of physical machines which are active and the number of VMs migration [14].

Sri hari Reddy Medapati et.al [15], proposed a system that uses virtualization technique for allocating datacenter resources dynamically based on application needs. The "skewness" is used to measure the unevenness in the multi-dimensional resource utilization of a server. The skewness can be reduced by merging variety of workloads and thus it greatly improves the overall utilization of server resources.

III. CONCLUSION

In Cloud Computing, energy consumption is a major challenge. In order to overcome those challenges, several efficient scheduling techniques had been discussed to minimize the energy consumed by the Virtual Machine (VM).

IV. REFERENCES

[1]Thiago Kenji Okada, Albert De La FuenteVigliotti, Daniel Macedo Batista, Alfredo Goldman VelLejbman, "Consolidation of VMs to improve energy efficiency in cloud computing environments".
[2]JayshriDamodarPagare, Dr.Nitin A Koli, "An Energy Efficient Virtual Machine Consolidation in Cloud Computing," International Journal of Innovative Research in Computer and Communication Engineering,vol.3,Issue 5,May 2015.
[3]Anton Beloglazov, JemalAbawajy, RajkumarBuyya, "Energy-aware resource allocation heuristics for efficient management of datacenters for Cloud computing," Future Generation Computer Systems 28(2012).
[4]Narander Kumar, Swati Saxena, "A Preference-based Resource Allocation in Cloud Computing Systems," ProcediaComputerScience 57(2015).
[5]Ziqian Dong, Ning Liu and Roberto Rojas-Cesssa, "Greedy scheduling of tasks with time constraints for energy- efficient cloud-computing data centers," Springer 2015.
[6]K.C.Gouda, Radika T V, Akshatha M, "Priority based resource allocation model for cloud computing," International Journal of Science, Engineering and Technology Research(IJSETR), Volume 2, Issue 1, January 2013.
[7]AnkitaChoundhary, ShilpaRana, K.J.Matahai, "A Critical Analysis of Energy Efficient Virtual Machine Placement Techniques and its Optimization in a Cloud Computing Environment",Proceedings on International Conference on Information Security & Privacy (ICISP 2015), 11-12 December 2015,Nagpur, INDIA.
[8]GhanshyamParmar, Dr.VimalPandya, "Energy-Optimized Virtual Machine Scheduling Schemes in Cloud Environment".
[9]Kushang Parikh, NageshHawanna, Haleema. P.K, Jayasubalakshmi.R and N.Ch.S.N.Iyengar, "Virtual Machine Allocation Policy in Cloud Computing Using CloudSim in Java," International Journal of Grid Distribution Computing, Volume 8, No.1, 2015.
[10]K.R.Dilip, J.BalaMurali Krishna, "Dynamic Resource Allocation to Maximize the Profits in Cloud Environment," International Journal of Computer Science and Information Technologies, Vol.5 (3), 2014.
[11]Anton Beloglazov and RajkumarBuyya, "Adaptive Threshold-Based approach for energy-efficient consolidation of virtual machines in cloud data centers".
[12]Weijie Shi, Chuan Wu, Zongpeng Li, "RSMOA: A Revenue and Social Welfare Maximizing Online auction for dynamic cloud resource provisioning".
[13]Young Choon Lee, Albert Y.Zomaya, "Energy efficient utilization of resources in cloud computing systems,"Springer(2012).
[14]Hongjian Li, Guofeng Zhu, "Energy-efficient migration and consolidation algorithm of virtual machines in data centers for cloud computing,"Springer 2016.

[15]Sri hari Reddy Medapati, K.Sathi Reddy, "Virtual Machine-Based Resource Management System for Cloud Computing Services," International Journal of Computer Science and Mobile Computing, Volume 3, No.1, 2014.

AUTHOR'S BIOGRAPHY

Dr.S.Thilagamani received the B.E. degree in Computer Science and Engineering from Periyar University, Salem, Tamil Nadu, India in 2002 and the M.E. degree in Computer Science and Engineering from Anna university,chennai,Tamil Nadu, India in 2007 and secured university second rank. She has completed her Ph.D. Programme in Anna University, Chennai. She has teaching experience of about 14 years. Presently working as Dean & Professor in the Department Of CSE. She has published 9 papers in the reputed international journals, 5 papers in the national conferences and 2 papers in the international conference. She has published 2 books. She has received award for best administration, cash awards and Gold coins for producing 100% results in the university examinations. She is an active member of CSI and coordinator of CSI student branch. Her area of interest is Data Mining.

T.Sangeetha received the B.E degree in Computer Science and Engineering from Anna University, Chennai, TamilNadu, India in 2015. Currently,she is pursuing her Master degree in the area of Computer Science and Engineering in M.Kumarasamy College of Engineering, Karur. Her area of interest is Cloud Computing and Computer Networks.