A SURVEY ON IMPROVED ENERGY EFFICIENT VM ALLOCATION ALGORITHMS IN CLOUD COMPUTING

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ABSTRACT

Cloud computing is enormous technologies in the computing paradigms and it also provides the number of services as per the customer requirements passing through the internet. The cloud services are requiring to the expenditure. In cloud computing, virtual machines allocation and energy efficient is one of the significant research topics. In order to, virtual machines and energy consumptions are consider decreasing the number of active hosts and minimize the power consumption in data center with the help of virtualization. This paper, presents diverse type of virtual machines allocation and energy efficiency algorithms and comparative study of their algorithms in cloud computing.

Keywords **Virtual Machine, Energy efficiency, VM allocation, Virtualization, Data Center.**

1. INTRODUCTION

Cloud computing is the development of grid computing, parallel computing and distributed computing [1]. The Cloud computing is considered for flexibility and availability at lower cost. Virtualization, versatility, extremely inexpensive, high reliability are the characteristics of cloud computing. Cloud delivers the services are using the components of service models and deployment models are given below.

1.1. Cloud Service Models

Infrastructure as a Service (IaaS): This type of service delivers elementary resources such as virtual storage, physical machines, virtual machines passing through the internet. E.g. Amazon Elastic compute cloud, Rack Space.

Software as a Service (SaaS): It delivers the software applications like word processor, calendar and schedule services to the end users. E.g. Mobile Me, Salesforce.com.

Platform as a Service (PaaS): It delivers the computing platform such as development and deployment tools, applications. E.g. Microsoft Azure, Google App Engine

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1.2. Cloud Deployment Models

There are mainly four types of clouds such as private, public, community and hybrid cloud.

Private cloud delivers the armed forces only single organization can be access. Each and every person can be access the services in the public cloud. Community cloud can be shared by several organizations but it supports a specific community for shared concerns. Hybrid cloud allows the combination of two or more clouds that is private and public.

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2. LITRATURE SURVEY

Chaima ghribi, et al., [2] presented exact allocation and migration schemes based on the linear integer program and two methods using for energy efficient virtual machine scheduling. This paper explores to reduce the energy consumption via consolidation. Here, algorithm includes extended Bin packing and best fit approaches for energy aware and time is more convenience. Their experimental result shows combining the exact allocation and migration algorithms to achieve the feasible solution. Norman bobroff, et al., [3] proposed virtual machines placement in the way of dynamically based on Measure Forecast Remap(MFR). This algorithm demonstrates virtual machine can achieve from

dynamic migration and also minimize the SLA violations. This author concludes the better result compared to the static approach. Xinying zheng and Yu Cai [4] discussed dynamic virtual machine migration schemes based on scheduling and live migration and also construct probability matrix for effectively mapping between the VM/PM request. Here mainly obtain for consider system power consumption and also be capable of dealing with worked spike. This paper deliver the results for minimize the amount of active modes. Yonghong yu et al, [5] suggested the combined approach for implement VM placement using constraint programming. This paper demonstrates the algorithm as bin packing and first fit decreasing, best first fit. Experimental on this procedure compared with cloud sim tool shows reducing data center and improving resource utilization.

Long zhang et al., [6] proposed virtual resources such as memory capacity, network bandwidth and CPU power using constraint programming in the method of dynamically. Here, declares only optimizing model for improving allocation by way of constraints. Their enhancing results produce low cost of virtual cloud resource and also reducing quality of service requirements.

Xiangming dai, et al., [7] presented the minimum energy virtual machine (VM) scheduling (minES) algorithm and minimum communication virtual machine scheduling algorithm (minCS) that extracts in cloud data center in support of energy efficient. The author concludes the results as compared with greedy first fit method and also to achieve the minimum energy consumption in a data center. Keqin Li, et al [8] proposed optimal speed schemes that extracts from dynamic power management with improved multicore server processor for minimize the power consumption constraints. Their result shows the average task response time reduction. Xiao-Fang Liu, et al., [9] presented Ant Colony System for finding the shortest path from source to destination via the pheromone to placement the virtual machines.

3. OVERVIEW ON VM AND ENERGY EFFICIENT

3.1. VMs SCHEDULING

Virtualization is act as an abstract service layer of the physical resources. In cloud environment virtualization acting is a significant task of providing services to the users in efficient manner. Storage virtualization, software virtualization, database virtualization, network virtualization and hardware virtualization are the types of virtualization for to allocate virtual machine to the client. Scalability, throughput, optimal resource utilization and availability are to main aspects of achieving techniques in virtualization. Virtual machine is a logical instance of a computer system that can operate similarity to a system [12]. Virtual machine Scheduling has scheduled in two ways namely virtual machine selection policy and virtual machine policy.

3.1.1. VM Selection Policy

The Data Center (DCs) should select the virtual machine based on the queuing model for allocating the job (resources) by the broker (cloud service provider).

3.1.2. VM Allocation Policy

Virtual machine provider provides the resources to the active host nodes when request for the virtual machine creation.

3.2. ENERGY EFFICIENT VIRTUAL RESOURCES ALLOCATION

In data center has number of active physical machine and number of virtual machine by the clients. First received by the VM When the request form the client to access the physical resources and then that VM allocates the resources to the client based on the related constraints are presented. Energy consumption of data centers sources are considered with cooling system, storage, hardware, bandwidth and computing nodes. The energy consumption main thing is to saving the power consumption and to reduce the number of active physical machine using virtual machine.

4. COMPARATIVE ANALYSIS

We consider the schemes, merits and remarks of existing energy efficient virtual machine allocation algorithms of comparative analysis Norman bobroff, et al., [3] proposed virtual machines placement in the way of dynamically based on Measure Forecast Remap(MFR). This algorithm demonstrates virtual machine can achieve from dynamic migration and also minimize the SLA violations. This author concludes the better result compared to the static approach. Xinying zheng and Yu Cai [4] discussed dynamic virtual machine migration schemes based on scheduling and live migration and also construct probability matrix for effectively mapping between the VM/PM request. Here mainly obtain for consider system power consumption and also be capable of dealing with worked spike. This paper deliver the results for minimize the amount of active modes. Yonghong yu et al, [5] suggested the combined approach for implement VM placement using constraint programming. This paper demonstrates the algorithm as bin packing and first fit decreasing, best first fit. The author concludes the results as

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Authors	Schemes	Algorithm	Merits	Remarks
Chima Ghribi , Makhlouf hadji, and Djamal Zeghlache [2]	Energy Efficient VM Sheduling for cloud data centers	Exact allocation and migration based on linear integer program	To reduce the energy consumption and migration costs	It compared with energy aware best fit algorithm
Norman bobroff, Andrej Kochut, Kirk Beaty [3]	Dynamic Placement of VM for managing SLA(Software Level Agreement) violations	Measure Forecast-Remap(MFR)	To reduce the number of physical host and SLA	Resource allocation in static consolidation based
Xinying Zheng, Yu Cai [4]	Dynamic Virtual Machine Placement for cloud	Dynamic Virtual Machine migration based probability matrix	To minimize number of active nodes and power consumption and extends users demand	The behavior of dynamic migration process is formulate on cost of electricity
Yonghong YU and Yang GAO [5]	Constraint Programming Based Virtual Machines Placement in Data center	Constraint Programming based First Fit Decreasing (FFD), BestFirst Fit(BF)	Improve resource utilization To reduce cost and number of active host	Technology of live migration in virtual machine is not effective
Long Zhang, Yi Zhuang and Wei Zhu [6]	Constraint Programming based Virtual Resources allocation model	Constraint Program	Low cost of resource usage To reduce the Quality of Service Violations	It consider only optimization model for improving allocation via constraints
Xiangming Dai, Jason Min Wang and Brahim Bensaou [7]	Energy efficient Virtual machines in multi-tenant Data Center	Minimum energy virtual machine schedule (minES) and minimum communication virtual machine schedule(min CS)	To manage multi tenant data center Energy saving in possible scenario	This algorithm sensitive for error predicting and contract in end dates
Keqin Li and Fellow [8]	Improving multi-core server performance Reducing Energy Consumption	Optimal speed schemes based on Queuing model	Improve system performance To reduce power consumption and minimize task response time	To require a constant internet connection on workload based dynamic power management