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Vibrant Resource Allocation Algorithms using Virtual Machine in Cloud-Survey

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ABSTRACT-Cloud computing is a usage of very large scalable and virtualized resources in a dynamic way over the internet. Due to the rapid growth of cloud environment usage many tasks require to be executed by the available resources .At the same time it should be possible to achieve better performance, optimizing the servers, reduce migration, support green computing, better resource utilization etc. so resource allocation using virtual machine plays a most important role in cloud environment because it should allocate proper resource to proper resources to various machines to get maximum benefit. In this paper we are going to study different set of resource allocation process and their concerns using virtual machines in cloud computing.

KEYWORDS -Cloud computing, Skewness, Black and Gray box, Vector Dot, Benchmark

I. INTRODUCTION

Cloud computing now becomes more advanced to enhance large set of business application. Cloud computing relies on sharing of resources to satisfy different business utility over a network. Cloud service providers are willing to provide services using large scale cloud environment with cost effectiveness. Also, there are some popular large scaled applications like social networking and e-commerce. These applications can benefit to minimize the costs using cloud computing. Cloud computing is considered as internet based computing service provided by various infrastructure providers on an on demand basis, so that cloud is subject to Quality of Service (QoS), Load Balance (LB), optimizing the server usage and other constraints which have direct effect on user consumption of resources controlled by cloud infrastructure

As an important cornerstone for clouds, virtualization plays a vital role in building this emerging infrastructure. Virtual machines (VMs) with a variety of workloads may run simultaneously on a physical machine in the cloud platform. Virtual machine monitors (VMMs) like Xen provide a mechanism for mapping virtual machines (VMs) to physical resources. This mapping is largely hidden from the cloud users. Users with the Amazon EC2 service, for example, do not know where their VM instances run. It is up to the cloud provider to make sure the underlying physical machines (PMs) have sufficient resources to meet their needs. VM live migration technology makes it possible to change the mapping between VMs and PMs While applications are running. However, a policy issue remains as how to decide the mapping adaptively so that the resource demands of VMs are met while the number of PMs used is minimized. With a different set of virtualized algorithms is Skewness, Black-gray box, vector dot.

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II. RESOURCE ALLOCATION

Dynamic resource provisioning, which has been widely used in internet hosting platforms, has proven to be useful in handling multiple time-scale workloads. However, this kind of dynamic provisioning in previous work has been more commonly based upon physical resource allocation, which is not flexible enough for the effective delivering of services.

Unlike other set of resources like VMs are flexibly deployed on physical machines, which can be automatically generated for different applications. For example, some set of applications such as gene expression and transferring demand a lot of CPU resources, while other real-time transaction applications and interactive online shopping are memory and network-intensive. Though traditional physical capacity provisioning has long been used, over provisioning or under-provisioning has been a common difficulty for most cloud resource users.

In Cloud, There are many tasks require to be executed by the available resources dynamically to achieve the optimal usage of servers, reduce migration of machines, Effective utilization of resources etc, Because of these different intentions, we need to design, develop, propose an resource allocation algorithms that is used to outperform appropriate allocation map of tasks on resources. Various allocation algorithms have been proposed by researchers; most important algorithms are Skewness, Black-Gray, Vector-dot, etc.

III. RESOURCE ALLOCATION ALGORITHMS

In the resource allocation in the cloud is based on set of concerns, to map the virtual Machine to physical resources. Hotspot migration is possible when machine get over loaded, Cold spot migration is done when machine get under flow, need to maintain green computing to reduce usage of idle servers. Usage of physical and virtual Machine might be fixed.

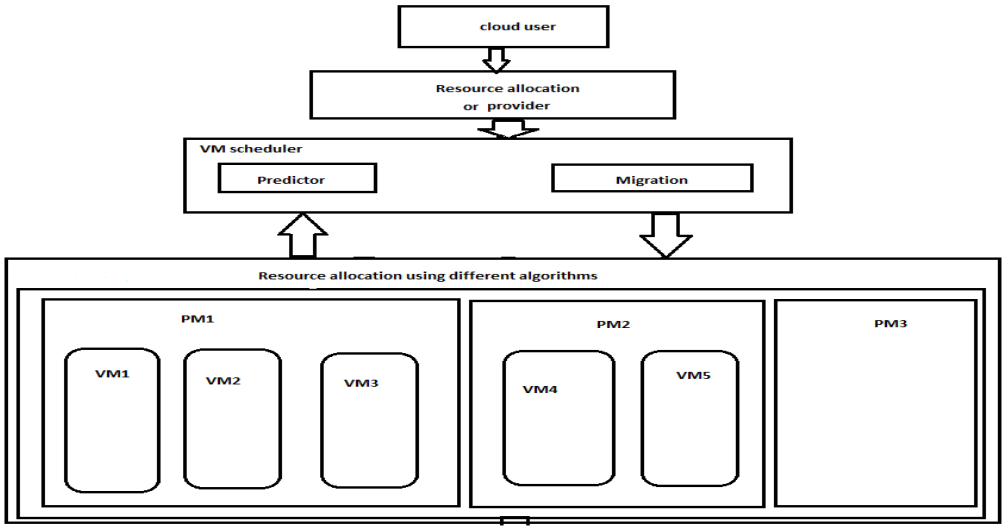

Fig 1: Resource Allocation in Cloud

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In the resource allocation cloud user may request different resources based on their needs [1], by using VM scheduler the resource can allocated. By using predictor the work load can allocate to physical machine which consist of no Virtual machines in it. Each machine consists of certain threshold value, if it exceeds the limit overload migration took place. In migration set of process can move to another machine. For allocation and migration different set of algorithms used in resource allocation are:

A.Skewness Algorithm

Skewness is used to quantify the unevenness in utilization of multiple resources on the server. By minimizing the skewness leads to combine of different combine different workloads and improve utilization of server. Skewness [2] consists of three steps: load prediction, hot spot migration, and green computing.

B.Black Box Monitoring

In black box large number of migrations is possible by increase load of virtual machine. In monitoring engine is responsible to tracking [5] the processor, network and memory usage of each virtual server. In this monitoring, load prediction and profile generation are difficult process and also different set of CPU, Memory, Network monitoring is done.

C.Gray Box Monitoring

Gray-box monitoring, when it feasible, using a light-weight monitoring daemon that is run inside each virtual server [8]. In different platforms supports statistics of CPU, network, and memory usage. The memory usage monitoring, in particular, enables proactive detection and mitigation of memory hotspots.

D. Vector Dot Algorithm

In vector dot scheduling HARMONY is used to virtualize the system. HARMONY extracts an end-to-end view of the SAN including performance and usage characteristics. Optimize the utilization of resource includes physical servers, data center network bandwidth and I/O bandwidth. Virtualizes storage migration [6] is done instead of virtual machine migration. Extended vector product (EVP) is used to measure current utilization of resource.

E. Green Scheduling Algorithm

Green scheduling can determine which server to be in running state. It will turn on and turnoff [7] servers based on load and virtual machine is allocated. Server must be in four states: OFF, ON, SHUTTING, RUNNING. Based on platform any of the state is triggered.

F. Benchmark Algorithm

The benchmark algorithm is a set standard algorithm to compare the performance of different heuristic resource allocation algorithms. It can perform based on CPU utilization, which monitor the utilization threshold and VM migration .CPU utilization is based on Mean absolute deviation (MAD) and inter-quartile range.

G. Control Algorithm

In the control algorithm a different set of technique is used to predict non-stationary workloads of the system. In this two set of process are used [4] Markov Host Overload Detection (MHOD) and Optimal Markov Host Overload Detection (MHOD-OPT).

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Algorithm	Allocation Parameters	Features
Skewness	Hotspot, cold spot throughput	To measure unevenness in resource utilization
Black box	Hotspot, cold spot throughput	More no migration is took place
Gray box	Hotspot, cold spot throughput	Not resolve all hotspots
Vector dot algorithm	HARMONY, network, i/o, physical server bandwidth	Optimizes utilization of resource Virtual storage migration is done
Green scheduling	Cold spot throughput	Usage of idle servers are reduce
Control	MHOD-OPT,MHOD	To estimate the migration probability
Benchmark	Standard resource allocation	Efficient resource allocation

TABLE I. FEATURES AMONG RESOURCE ALLOCATION ALGORITHM

IV. CONCLUSION

Cloud computing can solve complex set of tasks in shorter time by proper resource utilization. To make the cloud to work efficiently, best resource allocation strategies have to be employed. Utilization of resources is one of the most important tasks in cloud computing environment where the user's jobs are scheduled to different machines. The various strategies have been studied and classified. The different features of the algorithms have been studied. The future work will be concerned with the development of the better allocation algorithm which is in heterogeneous and works in dynamic environment using virtual machines.

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