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AN IMPROVED VM CONSOLIDATION TECHNIQUE FOR ENERGY EFFICIENT GREEN CLOUD

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ABSTRACT

On the Internet, a large amount of data is distributed, heterogeneous, dynamic, and more complex. Cloud computing has become a popular paradigm for hosting and delivering services over the internet. As the number of users increases who access the services of the Cloud the load of the machines in the cloud data center also increases. Virtual machines (VMs) in a data center are an effective way to reduce energy consumption and improve physical resource utilization. To balance the load efficiently one issue is to find an overloaded and loaded host and the second issue is to use an efficient method for selection of Virtual Machine from overloaded host and placement of Virtual Machine on the proper host. If proper care is not taken then even though statistical information becomes available from the data canter the machine either becomes overloaded or under loaded and indirectly its leads to lower resource utilization and improper Quality of services. So in this research, I am going to propose a dynamic threshold-based load balancing mechanism that not only takes care of the current load but also makes better utilization of the resources which leads to green Computing.

Keywords: Cloud computing, Virtual Machines(VM), Energy Consumption, Data Center, Load Balancing, Load Unbalancing.

1. INTRODUCTION

In recent years, cloud computing has gained popularity as a result of its ability to provide IT services focused on online use to global users. Cloud computing is a paradigm for developing the most sought after visual services based on the payment model as you go. Different types of applications, from science to business, can use cloud-based resources in a variety of ways, including software, computer hardware, and data. Major IT companies, such as Google, Amazon, Microsoft, and IBM, have upgraded their cloud data centers around the world to support cloud services. Cloud data centers allocate resources to users in a manner that satisfies the required Service Quality (QoS) determined by cloud subscribers through the Service Level Agreement (SLA). In a cloud computing, an SLA is defined as a two-way contract between a cloud provider and its users, and determines the content of the services provided, the level of performance, the prices, and the penalties for not providing the services. Any QoS violation leads to an SLA violation, and as a result, a fine should be paid by the service providers. Due to the rapid growth of cloud services and their associated technologies, cloud infrastructure has become more complex and sophisticated. Therefore, resource management is one of the most pressing issues in today's cloud environments, which directly affects the successful deployment of cloud services.

Load Balancing: In a cloud computing, cloud servers must remain balanced, in order to use resources at their full capacity. Sometimes it is possible for some servers to be overloaded while other servers are down or in idle state. To overcome this problem, download uploading algorithms are used. These algorithms help to assign all the same function by monitoring the load on each server. The simulation algorithm is defined as “The measurement of load in the cloud may be between real hosts or VMs. This measurement method distributes the variable workload evenly across all nodes (hosts or VMs). Cloud load balancing is also called load balancing as a service ”. There are a variety of load balancing algorithms used to create cloud computing; divided into two categories namely fixed load rating and dynamic load rating. Fixed load balancing algorithms assign servers tasks before integration where all resource requirements are identified by the algorithm. Job allocation is based on those needs. Static Load Balanced Algorithm is suitable for small distributed areas with high internet speed and unreliable communication delays It works best if systems or nodes have a noticeable difference in loading, so algorithms that come under static are generally not suitable for cloud computing. Because in the cloud we have a n number of users due to very different load. Powerful algorithms work in real-time mode, where it captures continuous information about server load. About that it decides to distribute tasks between servers. Thus we may share, redistribute or delete any activity on the server based on priorities. The Dynamic Load Balanced Algorithm focuses on reducing communication delays and performance time for large distributed areas. These techniques or algorithms are very effective in loading the measurement of cloud space in their nodes between different types of resources. Over the past few years there have been many static and flexible load balancing algorithms proposed for cloud computing. At this stage some of the existing algorithms proposed by the researchers are discussed.

2. METHODOLOGY

By using VM integration, cloud providers can improve the utilization of their services while reducing the amount of migration and processing time of data centers. Our proposed method of integrating VM includes the following:

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Overloading Host : It is distinguish when stranger should be considered overloaded, when one or more virtual machine are redirected to the other hosts to minimize host usage.

Under loading host: it is distinguish where stranger should be consider not as much of loaded, when all virtual machine are incorporated into other stranger; then, the host is switch to sleep mode.

Migration of VM: It is the Migration an important part of this process of load balancing. Then the load in a cloud and the latter is not complete and not including the new. Migration is the two types of cloud base business consideration of virtual machine migration and the work migration. Virtual machine migration is the virtual machine movement from the one host to another host too eliminate the most complete problem and is divided into categories such as a live VM migration.

Virtual Machine Selection: VM Selects the most suitable virtual machine to be transported to the most complete hosts in VM selection.

Virtual Machine Placement: It is find the most suitable local host for the selected virtual machine.

Create Map: we are not going that things which if the process and check the next host otherwise we will create map and add this mapping of overloaded host and under loaded host in to add migration map.

3. MODELING AND ANALYSIS

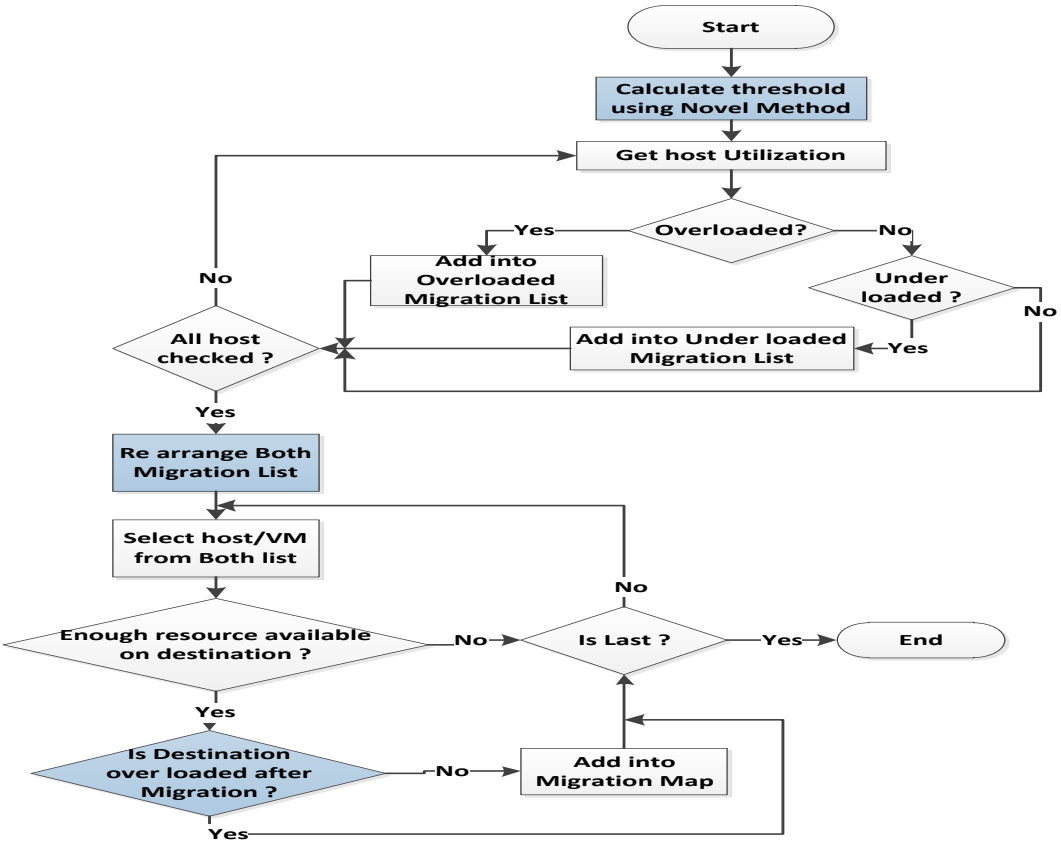

Figure 1: Flow Chart

Algorithm Step:

Step 1: Start

Step 2: Calculate threshold using novel method

Step 3: Get Host utilization of each VM on Host

Step 4: Get Overloaded Host utilization and Under loaded host utilization

Step 5: Overloaded Host is add into Overloaded migration list and Under loaded host is add in to under loaded migration list

Step 6: Then all Host We will Check

Step 7: Re arrange both migration list

Step 8: Select Host/VM from both list

Step 9: Enough resources are available then we will check if will migration this VM

Step 10: Enough resources are not available then process is end then check next Host

Step 11: check next Host otherwise we will Add into migration Map

Step 12: End

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4. RESULTS AND DISCUSSION

Table 1. Migration Cost Table

S N.	VM	Host	Cloudlet	Migration Time	
				Regular	Propose
1	20	20	50	1536192	1499997
2	20	20	100	1714921	1561234
3	20	20	150	2142231	1761345
4	20	20	200	2312561	2193451

Table2: No. of Migration

SN.	VM	Host	Cloudlet	Host migrate	
				Regular	Propose
1	20	20	100	13	9
2	20	30	100	17	12
3	20	40	100	21	16
4	20	50	100	27	22

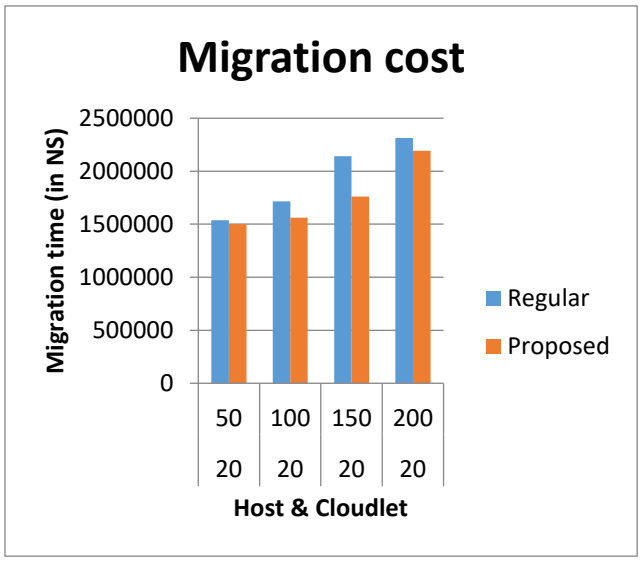

Figure 1: Migration Cost

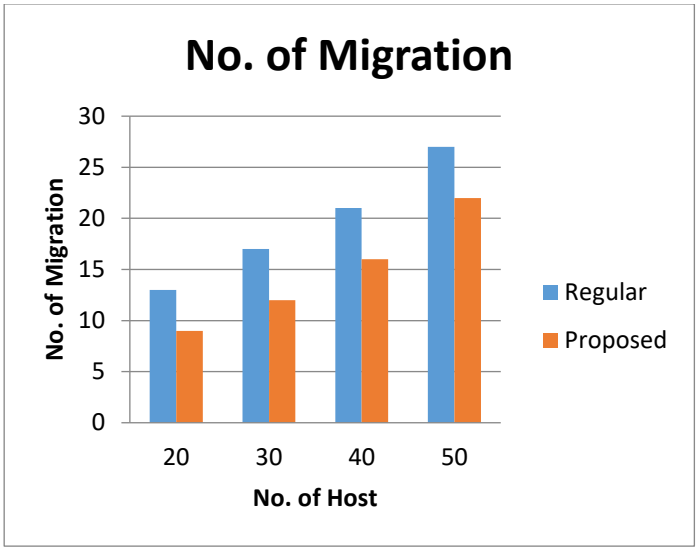

Figure 2: No. of Migration

Power Utilization

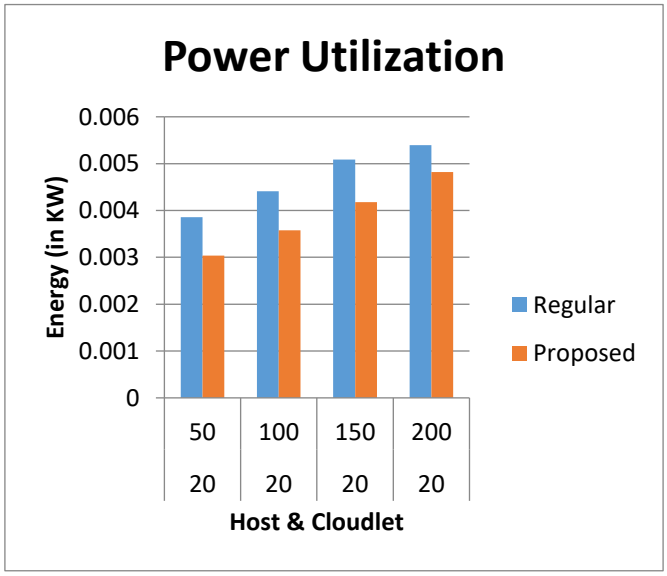

Figure 3: Power Utilization

No. of Migration

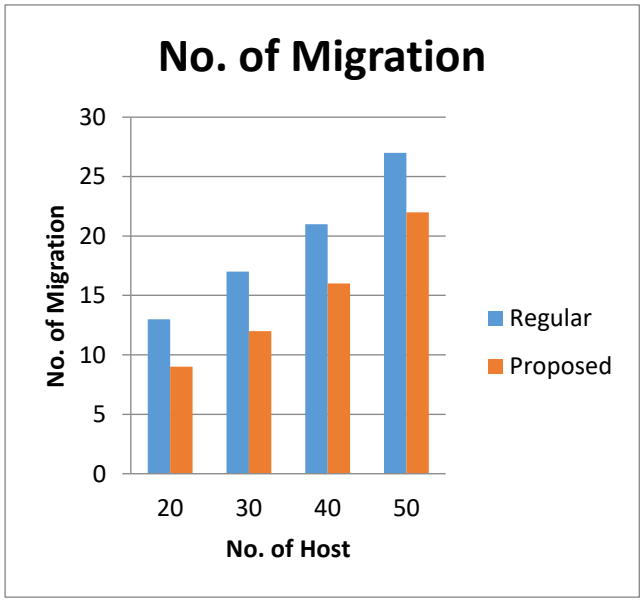

Figure 4: No. of Migration

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Migration Cost

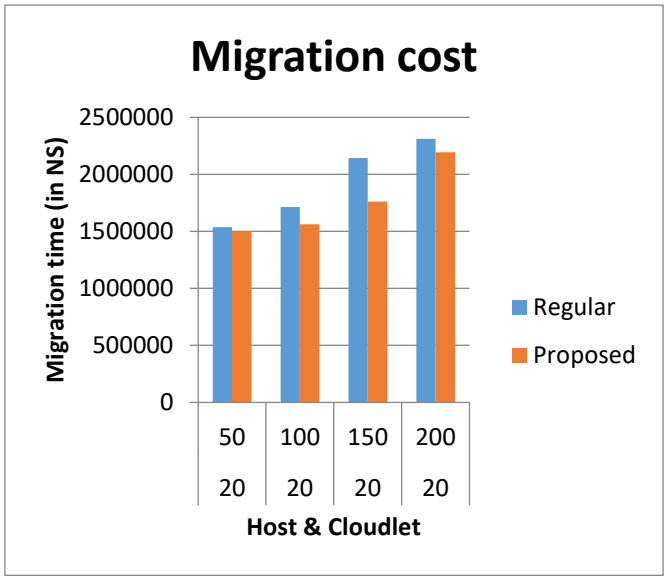

Figure 5: Migration Cost

Host Shutdown

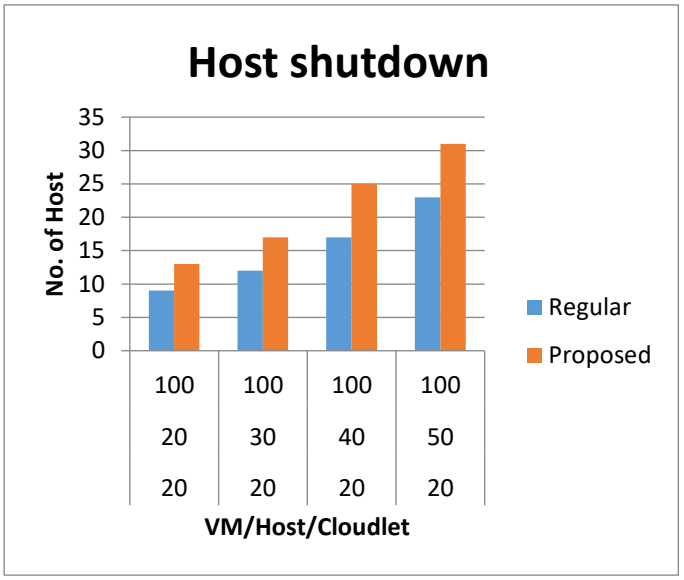

Figure 6: Host Shutdown

5. CONCLUSION

From all the discussion we can conclude following about proposed methodology. In this system we conclude that, the Due to Dynamic threshold calculation it's become easy to find under loaded and overloaded host. And the Number of migration reduced which save the time. By increasing the number of shutdown host reduce energy consumption. And Cloud customer can get better service as well as the providers have better utilization of resources with least power consumption.

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