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Review An Efficient Approch To The Green Computing For Load Balancing

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***Abstract* - Cloud computing is an expanding area and most discussible in the field of research, industry and development today, which involves virtualization, distributed computing, internet, and software and web services. While a large body of work now a days has recently focused on reducing energy expenses of data center's, there exists no prior work on investigating the trade-off between minimizing energy expenditure of data center's and increase the processing speed for various Internet and cloud computing services that they may offer. This paper presents an approach for scheduling algorithms that can maintain the load balancing. In this research work we have developed power optimization algorithm which over comes the limitations of the previous algorithm & it helps in optimization of the energy consumption along with the operation of load balancing in data centre.We implements strategy known as Round Robin (RR) scheduling algorithms which will give better result than existing one.**

***Index Terms* — cloud computing, virtualization, Load Balancing, Scheduling,Green Computing, Round Robin.**

I. INTRODUCTION

Cloud Computing is made up by aggregating two terms in the field of technology. First term is Cloud and the second term is computing. Cloud is a pool of heterogeneous resources. It is a mesh of huge infrastructure and has no relevance with its name "Cloud". Infrastructure refers to both the applications delivered to end users as services over the Internet and the hardware and system software in datacenters that is responsible for providing those services [1]. In order to make efficient use of these resources and ensure their availability to the end users "Computing" is done based on certain criteria specified in SLA. Infrastructure in the Cloud is made available to the user's On-Demand basis in pay-as-you-say-manner.

Cloud computing provides different services such as infrastructure as a Service(IaaS), platform as a Service (PaaS), and software as services SaaS), which are made available to consumers as subscription-based services under the pay-as-you-go model. Clouds aim to drive the design of the next generation data centres by architecting them as networks of virtual services. So that users can access and deploy applications from anywhere in the world on demand at competitive costs depending on their requirements. Cloud computing offers significant benefits to IT companies by freeing them from the low-level task of setting up basic hardware and software infrastructures and thus enabling focus on innovation and creating business value for their services.

Public clouds [4] may be used by individuals or an organization based upon their requirements and necessities. They offer greatest level of efficiency in shared resources. Confidentiality is the major security issue in using public cloud. They are more vulnerable than private clouds. Amazon web services [8], Google Compute Engine [9], Microsoft Azure [10], HP cloud [11] are some of the public clouds. A hybrid cloud [4] is a combination of public and private cloud. It allows businesses to manage some resources internally within organization and some externally. The downside is that the complexity of overall management increases along with security concerns. To optimize the use of one or more combination of private or public clouds CliQr [11] .

Green Computing is defined as the study and practice of using computing resources efficiently through a methodology that combines reducing hazardous materials, maximizing energy efficiency during the product's lifetime, and recycling older technologies and defunct products[4]. Green Computing enables companies to meet business demands for cost-effective, energy-efficient, flexible, secure & stable solutions while being environmentally responsible. Every data center transaction requires power. Efficiency, equipment disposal and recycling, and energy consumption, including power and

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cooling costs, have become priority for those who manage the datacenters that make businesses run [5].

II. LITERATURE REVIEW

In[2], Anton Beloglazov and Rajkumar Buyya have proposed Markov chain model in order to overcome limitations of heuristic or statistics based approaches to identify and mitigate overloading problems in datacenters. They have proposed a novel approach that for any known stationary workload and a given state configuration optimally solves the problem of host overload detection by maximizing the mean inter-migration time under the specified QoS goal based on a Markov chain model. They heuristically adapt the algorithm to handle unknown non-stationary workloads using the Multisize Sliding Window workload estimation technique. Through simulations with real-world workload traces from more than a thousand PlanetLab VMs, it was shown that the proposed approach outperforms the best benchmark algorithm and provides approximately 88% of the performance of the optimal offline algorithm.

In [4], Daniel J. Abadi discusses the limitations and opportunities of deploying data management issues on cloud computing platforms. He anticipated that large scale data analysis tasks, decision support systems, and application specific data marts are more likely to take advantage of cloud computing platforms than operational, transactional database systems. A review of the currently available open source and commercial database options that can be used to perform such analysis tasks, and concluded that none of these options, as presently architected, match the requisite features. He concluded that a hybrid solution that combines the fault tolerance, heterogeneous cluster, and ease of use out-of-the-box capabilities of MapReduce with the efficiency, performance, and tool plugability of shared-nothing parallel database systems could have a significant impact on the cloud database market.

Qi Zhang, Lu Cheng and Raouf Boutaba: Zhang et al in their study presented a comprehensive review of literature on cloud computing. They concluded that even though cloud computing is attractive to business owners as it eliminates the requirement for users to plan ahead for provisioning, and allows enterprises to start from the small and increase resources only when there is a rise in service demand. However, despite the fact that cloud computing offers huge opportunities to the IT industry, the development of cloud computing technology is currently at its infancy, with many issues still to be addressed.

In [5], Bhaskar Prasad Rimal, Eunmi Choi and Ian Lumb presents researchers have first developed a comprehensive taxonomy for describing several cloud computing architectures. Then they have send this taxonomy to survey these cloud computing services. The researchers have concluded that there is a need for further progress on several issues such as standards, portability, interoperability, mappings to business architecture, security and privacy, multi – supplier and hybrid sourcing, management and governance plus business analytics for clouds.

Shu-Ching Wang, Kuo-Qin Yan, Wen-Pin Liao and Shun-Sheng Wang: As known cloud computing refers to a class of systems and applications that employ distributed resources to perform a function in a decentralized manner utilizing the computing resources (service nodes) on the network to facilitate the execution of complicated tasks that require largescale computation. Thus, the selection of nodes for executing a task in the cloud computing must be properly considered to exploit the effectiveness of the resources. Wang et al, in this study, propose a two phase scheduling algorithm under a three-level cloud computing. The proposed scheduling algorithm combines OLB (Opportunistic Load Balancing) and LBMM (Load Balance Min-Min) scheduling algorithms that can utilize more better executing efficiency and maintain the load balancing of system.

In [13], focuses on load balancing of cloud datacenters to improve working efficiency of the host machine ,minimize number of active host machine to support green computing concept as well. This paperintroduces a threshold based Dynamic compares and balance algorithm (DCABA) for cloud server optimization. This paper also shown the applicability of load balancing and server consolidation techniques to obtain measurable improvements in server workload management and minimize the cost of cloud services.

In [14], in cloud, load balancing of nodes using Ant Colony Optimization algorithm described the example of an ant that how t the ant care for every node they visit and record their data for future decision making. Such efficiently distributes the load among the nodes such that the ants never encounter a dead end for movements to nodes for building an optimum solution set.

In [15], paper proposed a comparative study between three load balancing architectures in cloud computing namely centralized, decentralized ,hierarchical load balancers. Among the critical factor that affects the

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performance of a load balancer is its architecture which can be decentralized, centralized or hierarchical.

Need Of Green Computing

Now a days computers are widely used in every field to increase the accuracy, productivity and speed of work, but the computer can not work without power, that's why if the use of computer is increase it leads to increase of power consumption and greater heat generation leads to greater emission of greenhouse gases like Carbon Dioxide (CO2) that can be harmfull to environment and natural resources. Many people are not aware that the CPU and fan consume power; screen savers consume power even when the system is not in use. Insufficient power and cooling capacities can also results in loss of energy. This all become responsible for the polluted environment . Its observed that most of the data centers used old technologies based system and they don't have sufficient cooling capacities [1].

This all leads us towards the polluted environment. The environment pollution could be because of the defects in Manufacturing techniques, packaging, disposal of computers and components. There are toxic chemicals used in the manufacturing of computers and components which can enter the food chain and water. It is observed from one source, "Information Technology energy demand is growing Twelve times faster than the overall demand for energy" and Data centers emits 150 metric tons of CO2 per year, and the volume is increasing rapidly [10].

III. PROPOSE WORK

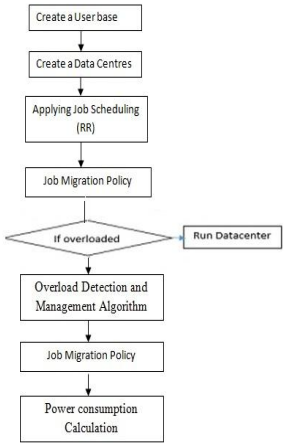

Figure. The system model

The first step includes in is to create userbase which consist of number of registered customers to access the cloud services which is performed on the confirmation of Service level Agreements (SLAs).

Second step is to maintain different servers which consist of different variety of data which may be or may not be same. Different servers are maintaining to reduce overhead on single server. Next step is to assign scheduling on number of request comes from cloud users which are initially at queue.

Round Robin Algorithm (RR) is the simplest algorithm that uses the concept of time quantum or slices. Here the time is divided into multiple slices and each node is given a particular time quantum or time interval and in this quantum the node will perform its operations.

Next step is to detect the overload and applying management policies to it in order to solve overload problem and last step is identify total power consumption for execution of all processes or requests.

IV. CONCLUSION

In this research work we have presented comprehensive reviews on algorithm that helps in optimization of the energy consumption along with the operation of load balancing in data centre which is power aware , uneven balance of workload in terms of either under utilization or over utilization our algorithm works to consolidate the work load processing by introducing data load controller which is handled by management policies which also takes into account the inter node bandwidth, as some servers or host machines may be having VM that are working in some precedence or in some particular workflow, or simply there is dependency between them to process the workflow steps , thus need some level of optimization .Our proposed algorithms also takes one step further in green computing in order to reduce power consumption.

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