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A 'No Data Center' Solution for Cloud Computing/File Hosting

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Abstract: Cloud computing is one of the emerging technology in the last decade. The cloud computing is growing and spreading very fast due to its easy and simple service oriented model provided via internet . As the number of users are growing very fast to access the cloud therefore it is very difficult and challenging task for the service providers to provide maximum resource output to theirs users. The main objective of the service providers to provide maximum output can be achieved by implementing load balancing efficient algorithms. Load balancing in cloud computing will help clouds to increase their capabilities. capacity which results in powerful and reliability cloud and only objective of the service provider .
Keywords: cloud computing , load balancing , load balancer.

I. INTRODUCTION

The performance of computational system depend on several concepts , one of which is load balancing . The load balancing mechanism is totally dependent on the amount of work allotted to the system for a specific time period . This is the where the system has to manage and work according to priority basis . The interaction with factors
or through a data centre , since data from various users and business organizations lie together in cloud. their data to a third person that may raise security problems. Cloud computing is a service oriented architecture.
Security and privacy stands as major obstacle on cloud computing i.e. preserving confidentiality, integrity and availability of data. A simple solution is to keep all the data on your own server and you can access it from anywhere and anytime through your id and password. This approach ensures that the data is not visible to external users and cloud administrators but has the limitation that your server needs to be active for 24 hours. In this paper, we discuss what are the requirements for this file hosting server and how this solution can be achieved.

II. LOAD BALANCING

In distributed systems load balancing is defined as the process of distributing load among various nodes to improve the overall resource utilization and job response time. While doing so, it is made sure that nodes are not loaded heavily, left idle or assigned tasks lesser then its capacity It is ensured that all the nodes should be assigned almost the same amount of load
If resources would be utilized optimally, performance of the system will automatically increase. Not only this, the energy consumption and carbon emission will also reduce tremendously. It also reduces the possibility which occurs due to the load imbalance. Furthermore, it facilitates efficient and fair distribution of resources and helps in the greening of these environments .
Load balancing algorithms are classified into categories for the ease of understanding. That helps in identifying a suitable in the time of need. A detailed view of classification is presented below
Gulati et al claimed that in cloud environment a lot of work is done on load balancing in homogeneous resources. Research on load balancing in heterogeneous environment is given also under spot light. They studied the effect of round robin technique with dynamic approach by varying host cloudlet long length, VM image size and VM bandwidth. Load is optimized by varying these parameters. Cloudsim is used for this implementation. A hybrid load balancing policy was presented by Shu-Chang. This policy comprises of two stages 1) Static load balancing stage 2) Dynamic load balancing stage. It selects suitable node set in the static load balancing stage and keeps a balance of tasks and resources in dynamic load balancing stage. When a request arrives a dispatcher sends out an agent that gathers nodes information like remaining CPU capacity and memory. Hence the duty of the dispatcher is not only to monitor and select effective nodes but also to assign tasks to the nodes accordingly. Their results showed that this policy can provide better results in comparison with min-min and minimum completion time (MCT), in terms of overall performance.

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III. LOAD BALANCING ALGORITHM.

1) *Static Load Balancing Algorithms:* Gulati et al. [24 claimed that in cloud environment a lot of work is done on load balancing in homogeneous resources. Research on load balancing in heterogeneous environment is given also under spot light. They studied the effect of round robin technique with dynamic approach by varying host , cloudlet long length, VM image size and VM bandwidth. Load is optimized by varying these parameters. CloudSim is used for this implementation.
2) *Dynamic Load Balancing Algorithms:* A hybrid load balancing policy was presented by Shu-Ching et al. This policy comprises of two stages 1) Static load balancing stage 2) Dynamic load balancing stage. It selects suitable node set in the static load balancing stage and keeps a balance of tasks and resources in dynamic load balancing stage. When a request arrives a dispatcher sends out an agent that gathers nodes information like remaining CPU capacity and memory. Hence the duty of the dispatcher is not only to monitor and select effective nodes but also to assign tasks to the nodes accordingly. Their results showed that this policy can provide better results in comparison with min-min and minimum completion time (MCT), in terms of overall performance.

Another algorithm for load balancing in cloud environment is ant colony optimization (ACO) . This work basically proposed a modified version of ACO. Ants move in forward and backward directions in order to keep track of overloaded and under loaded nodes. While doing so ants update the pheromone, which keeps the nodes' resource information. The two types of pheromone updates are 1) Foraging pheromone, which is looked up when an under loaded node is encountered in order to look for the path to an over loaded node. 2) Trailing pheromone is used to find path towards an under loaded node when an over loaded node is encountered. In the previous algorithm ants maintained their own result sets and were combined at a later stage but in this version these result sets are continuously updated. This modification helps this algorithm perform better.

Genetic algorithm is also a nature inspired algorithm. It is modified by Pop et al, to make it a reputation guided algorithm. They evaluated their solution by taking load-balancing as a way to calculate the optimization offered to providers and makespan as a performance metric for the user.

Another such algorithm is the bees life algorithm (BLA) , which is inspired by bee's food searching and reproduction. This concept is further extended to specifically address the issue of load balancing in . The Honey bee behavior inspired load balancing (HBBLB) algorithm basically manages the load across different virtual machines for increasing throughput. Tasks are prioritized so that the waiting time is reduced when they are aligned in queues. The honey bee foraging behavior and some of its variants are listed in .

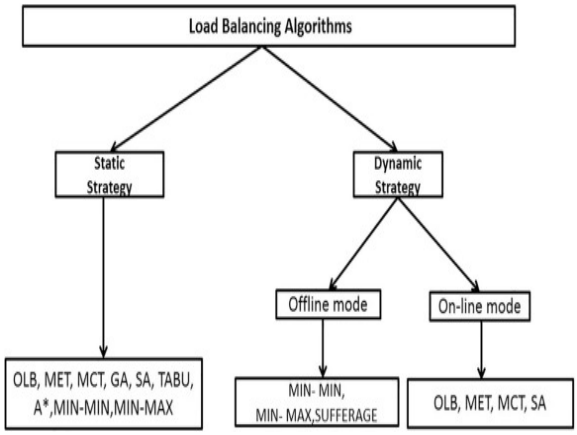


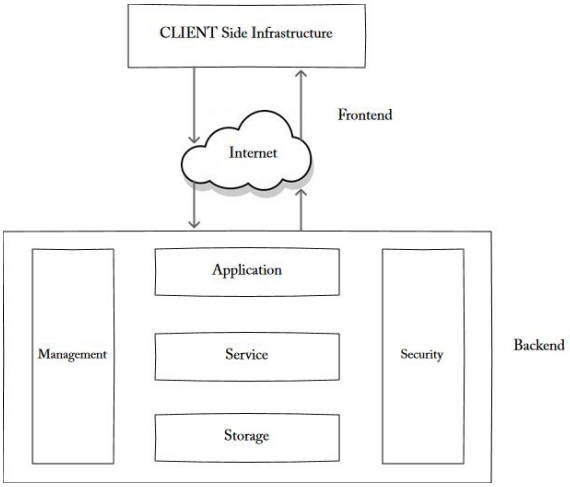
Fig: Load Balancing.

IV. LOAD BALANCING ALGORITHM

A comparative study of different load balancing algorithms is presented in . Load balancing is not only required for meeting users' satisfaction but it also helps in proper utilization of the resources available. The metrics that are used for evaluating different load balancing technologies are: throughput, overhead associated, fault tolerance, migration time, response time, resource utilization, scalability, and performance. According to this study, in honeybee foraging algorithm, throughput does not increase with the increase in system size. Biased random sampling and active clustering do not work well as the system diversity increases. OLB + LBMM shows better results than the algorithms listed so far, in terms of efficient resource utilization. The algorithm Join-Idle-

Queue can show optimal performance when hosted for web services but there are some scalability and reliability issues that make its use difficult in today's dynamic-content web services. They further added that minmin algorithm can lead to starvation. They concluded that one can pick any algorithm according to ones needs. There is still room for improvement in all of these algorithms to make them work more efficiently in heterogeneous environments while keeping the cost to a minimum. A somewhat similar analysis of load balancing algorithms is presented by Daryapurkar et al. and Rajguru and Apte as well. Different scheduling algorithms for the hybrid clouds compared by Bittencourt et al, highlights that the maxspan of these algorithms widely depend on the bandwidth provided between the private and public clouds. The channels are usually part of the internet backbone and their bandwidth fluctuates immensely. This makes the designing of the communication aware algorithms quite challenging.

V. PROPOSED ARCHITECHTURE.



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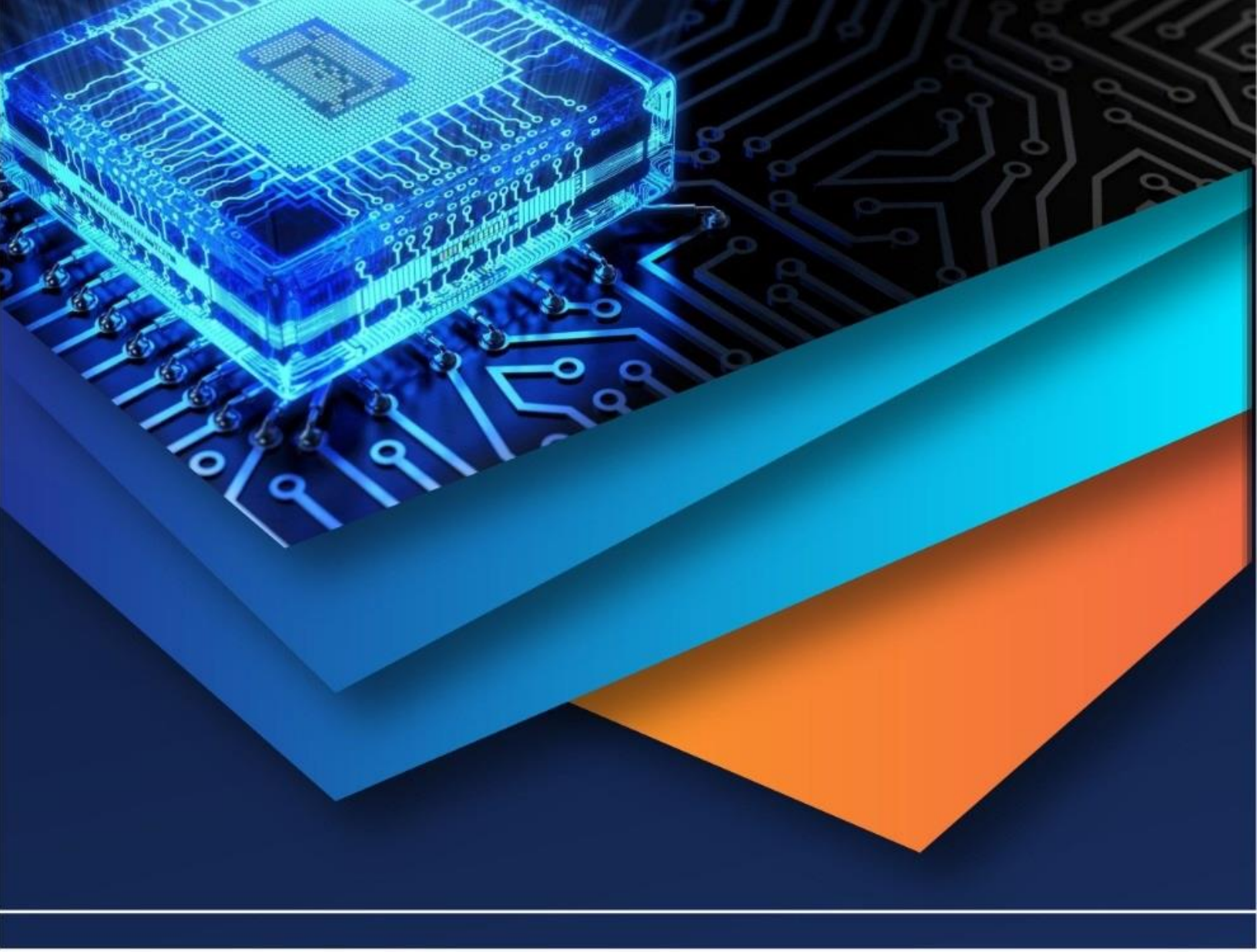

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