

DESIGN NOVEL TECHNIQUE FOR LOAD BALANCING USING ADVANCE GENETIC ALGORITHM

Dr. Manmohan Singh, Associate professor Department of Computer Technology and Application,

RKDF School of Engineering, Indore, Madhya Pradesh

Purva Upadhyay MTech [CTA] RKDF School of Engineering

purva.upadhyay05@gmail.com

Abstract

In cloud computing load balancing is the fore most problem. Balancing the load is essential to allocate the dynamic load consistently across numerous nodes in the network. Overloading of the system will lead to reduced performance. An efficient load balancing algorithm is important for utilizing the resources proficiently the aims of load balancing the rendition is significantly enhanced. Since the volume data is increasing exponentially, the essential for retrieving the data rapidly over the cloud is attractive of extreme significance. The proposed algorithm can be implemented but this algorithm can similarly be improvised. Cost-efficient stag essential to be developed which can reduce the cost and similarly afford great speed aimed at the user. In this research work, we have presented Modified existing Load Balancer algorithm using genetic algorithm for proficiently distributing the jobs between the accessible VMs. We can evaluation the load balancing algorithms with respect to the response time of VMs allocated jobs.

Keywords: *Virtual Machine, Load Balancing, Cloud Analyst, Cloud Data Center, Virtualization, User Base's*

1. INTRODUCTION

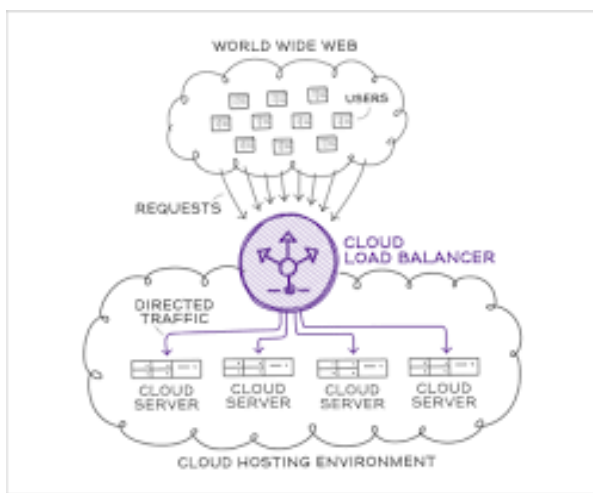
Cloud computing, in order to understand cloud computing lets divide the cloud computing in two parts, first one is computing, whenever there is computing, there is one word that comes to our mind is "Computer" a computer is, that compute something with the help of processor and memory. And a cloud is a different name that has been used for the internet ,it is a different name that has been used for anytime, anywhere, so it makes cloud computing as anytime, anywhere storage. For example if you are anywhere (school ,college) you are in a moving bus or moving train then you can have storage .For

example if a person is at location A and gives something to cloud for storage, then person moves to location B then also the information stored can be reterived easily .Cloud computing is widely used by big/small organizations ,even individuals use cloud to get benefited with the services that cloud offers. The cloud offers following advantages:-

- With cloud the billing model is pay as you go, it means you use less=you pay less.
- In cloud no huge space is required for setting up servers.
- Also no experts are required for hardware and software maintainence as it is all maintained by the service providers.etc

Cloud computing is ability to deliver on demand computing services over internet, on a pay as you go basis, rather than managing files on a local storage devices, it enables to store it over the internet and also access them from the same. Cloud Computing can be classified into three categories: Infrastructure as a Service, Software as a Service and Platform as a Service. And as they method on top of unique additional, these are sometimes called the Cloud Computing Stack. their alterations make it easier to achieve the business goals

Load balancing, a web application to run over internet deploy many servers at the backend, for the user interface, these servers run's the same information as the application that is running over internet. When too many request's occurs at server then is compoulsory to channel these requests across the servers. Load balancers does these job of taking the incoming traffic and distribute it among number of servers. The load balancer computes the specific time-span and uses this value to estimation the virtual machine accessibility for the subsequent time span.



It is a process of conveying the total load to the specific nodes of the cooperative system to variety resource utilization effective and to progress the response time of the job, concurrently removing a condition in which particular of the nodes are completed loaded while particular others are under loaded. It can be experiential CPU utilization, quantity etc The objective of this research determination is to save resources so that we can allocate the resources to added number of processes in instruction to growth efficiency. Numerous techniques are used to afford effective load balancing in cloud computing. following are some existing load balancing algorithms used in cloud computing environment:-

Round robin-requests incoming are forwarded to the servers in a cyclic manner.

TLB- here an index is maintained by the load balancer which conatins the status of VM's as available or busy

Esce –it spreads the load by taking into account current load at a node

Genetic algorithm is unique soft computing technique used aimed at the load balancing in cloud. The genetic algorithm attempts to balance the load of the cloud infrastructure while minimizing the variety span of specified task set. In this research work, we have presented Modified existing Load Balancer algorithm using genetic algorithm for proficiently distributing the jobs between the accessible VMs. The dissimilar Cloud services can be retrieved by dissimilar users. Our proposed research certifies that completely the processor in the system or each node in the network does around achieve the identical amount of work at several instant of time.

2. RELATED WORK

Dasoriya, R et al[1]collective workload, the essential for load balancing is improved. This research into Dynamic Load Balancing in Cloud Computing will advantage the society in frequent ways. It will lead to better exploitation of resources based on current user necessities. As workload will be dynamically disseminated, users will have additional time on their hands to invest in responsibilities yielding productive consequences. Load balancing will similarly make handling data easier, as this is also distributed efficiently.

Deepa, T. et al[2] In this research work the author analyzed numerous static and dynamic load balancing algorithms with their merits and demerits. Additional work can be completed by exploring novel effective load balancing algorithm which can preserve improved balance amongst parameters.

Kaur, S et al[3]In this research work, Central Load Balancer load leveling formulation is overviewed to balance the burden amongst effective products with reasoning data center. Concluding out comes exhibit that the formula can achieve superior insert leveling in large-scale reasoning computing surroundings when in evaluation to preceding balancing algorithms.

Patel, D et al[4]simple goal is to progress a appropriate load balancing algorithm improved to the heterogeneous Grid computing environment. This offerings a dynamic and distributed load balancing algorithm called EGCE which estimations the predictable appearance time of a job on resources on every job arrival and then balances the load by scheduling jobs by enchanting in to account the heterogeneity in resources and networks. The proposed load balancing strategy is counterfeit on the Grid Sim platform .that technique reduces the regular response time.

Handhal et al[5]proposed a novel technique was presented to reestablish balance in electric distribution network. This technique is intended to operate inside a region consisting of a re-distribution and balancing device and intelligent devices (smart meters) in every house that switches amongst the three phases by expending number of contactors. Where particular of these houses effort as three phase loads and the additional as a single phase loads. The balancing is accomplished by swapping the phases on one or additional precise houses conferring to the heuristic search algorithm.

Volkova, et al[6] review of load balancing and the three existing policies aimed at the Cloud Analyst simulator, can accomplish that load balancing is a composite task in cloud computing. Linking the consequences acquired using dissimilar load balancing algorithms, accomplish that the overall response time in the Throttled algorithm is improved than in additional algorithms, and the data center time is also improved.

3. PROBLEM WITH EXISTING SYSTEM

In previous load balancing algorithms complexity have an overall effect on all the performance of the systems . In terms of complexity the algorithm are simple but in term of migration time, fault tolerance and response time may give poor performance

The proposed algorithm will try to improve the performance by providing the resources on demand and also improve overall response time, which may increase the number of overall task execution but definetley reduces the number of task rejections

4. PROPOSED METHODOLOGY

Algorithms are optimization techniques ,used to generate the optimal solution . The uncertainty of the request requirement and the multiple of resource capability in cloud, there exists inescapably load imbalance of resource providing, which could variety certain nodes through heavy load unable to receive tasks, or some nodes with less load unable to be consumed entirely. Load balancing is used to allocate additional load to smaller processing nodes to expand overall system performance.In a cloud computing environment, load balancing requirements to allocate the dynamic local workload consistently among entirely nodes. Load balancing supports in the reasonable allocation of computing resources to accomplish a high level of user full-fillment and appropriate use of resources. High resource exploitation and correct load balancing support minimize resource consumption.

Genetic algorithm, uses the concepts from evolutionary biology to reach the global optimal solution for an optimization problem. The name Genetic Algorithm comes from the fact that they are mimicking the evolutionary biology techniques. Genetic Algorithm work with generation of an initial candidate solutions, that are tested against the objective function. The candidate solutions are generated through –

- Selection- parents are selected from these generation for reproduction

- Crossover- common similarities are selected between different parents obtained from the first generation.
- Mutation – in mutation we take a parent and mutate certain values to form random child

Genetic algorithm pseudocode-:

Initialization of population P

While not terminate do

Evaluate P by fitness function

P'=selection.crossover.mutation of P

P=P'

Terminate condition-

Found satisfactory solution

Else

Replace the least fit solution with new individuals

This supports to implement fault tolerance, scalability and elude problems. Load balance supervisor policy manages the physical and logical resources. UB Jobs request technique to proximate VMs. VMs performed the UBs demanded jobs.. Threshold value supports to isolate the high and low load VMs. Our proposed algorithm based policy achieves the load and discovers the VMs and migrate the jobs with the support of threshold model. The proposed algorithm is significant option to load management. The algorithm divide in binary parts, main algorithm are liable for supervision the VMs, migration of VMs and supervision of UB request in VMs. And subsequent approach the threshold of VMs to check completed situation.. In order to happen the user requirements, building complete use of resources to find an effective and reasonable task scheduling is needed. There are numerous traditional task scheduling algorithms, simple as round robin algorithm, equally distribute current execution and throttled. They might accomplish well sometimes, but the limitations are also non-ignorable. Round robin algorithm, equally distribute current execution and are not appropriate for the situation where VMs have dissimilar performance. And throttled algorithm is probable to reason the problem of load imbalance

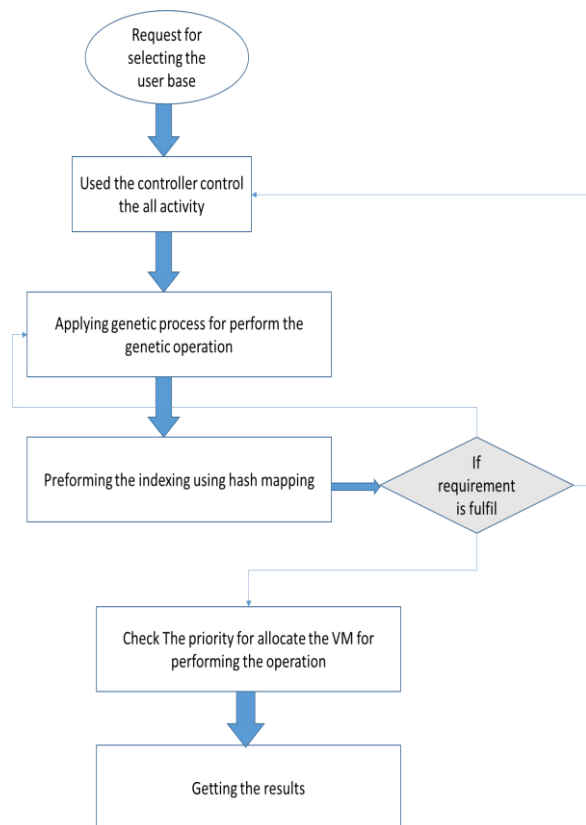


Figure 1: proposed scheme flow chart

5. PROPOSED ALGORITHM

Consequently, how to organize the load complete the suitable load balance mechanism for expand the cloud resource exploitation efficiency and system performance is an urgent problem presently. For solving the load imbalance in cloud computing situation, our foremost contributions in this research work:

- An optimization model of load balance in cloud computing is built to contribute the independent function of our algorithm.
- our proposed approach based on genetic algorithm is available to optimize the load imbalance problem of resource dissemination in cloud computing.
- convinced concert analysis of the proposed algorithm are accomplished.
- An application consequence of load balance in cloud computing environment is created to determine the prominence of our algorithm.

Proposed scheme for allocating VM assign the Input:

Choose Processors Prescribed VM

Phase 1: Choose to select total amount of processors according to need

Phase 2: Compute the comparison matrices for all processors.

Phase 3: compute the priorities of entirely processors permitting to the calculations of genetic approach.

Phase 4: allocate the processor through maximum priority through jobs to effect.

Algorithm:

Initialize the set H with available set of host machines along with available resources

- 1) Firstly the request's arrives at the main data controller.
- 2) Check the current status of available VM'S to serve the incoming requests
- 3) GA based load balancer is activated after identifying the task requirement
- 4) VM list of available VM is created for allocation through selection process of genetic load balancer.
- 5) The list obtained is tested against the objective function to obtain the global optimal solution.
- 6) Repeat step 4, 5 till the termination condition is met.
- 7) The obtained solution is further carried for hashing process.
- 8) The load of node is tested using hash table .if it has minimum load then VM is allocated using hash key.
Else
- 9) Hash table is scan to search the node with minimum load.
- 10) Finally VM is allocated to requesting job and table is updated.

Our proposed Load balancing networks and resources, to afford maximum throughput with minimal response time. Load balancing is achieved at binary levels in cloud computing. The level of the VM, the mapping is made among requests that are loaded in the cloud on the virtual machine. The load balancer allocates the requested virtual machine(VM) to physical computers, which balances the load of numerous applications from the PC A host level, a representing among the virtual machine(VM)and host resources that permit processing of several incoming request requests. In this research work, we have presented novel Load Balancer algorithm for professionally distributing the load between the accessible VMs. This research work also analyses and associates the load balancing algorithms with respect to the response time of VMs allocated jobs.

6. CONCLUSION

A virtual VM resource providing genetic algorithm created on load balance. As represent now the Genetic Algorithm outperforms specific existing load balancing techniques. By specified the arranged input to the genetic algorithm the response time can be larged and by that the response time will be reduced and minimizes the make span of specified task set. Here the jobs are expected that having similar priority that might not be definite case to that can be occupied for additional work and the numerous selection techniques for GA can be changes for improved performance and crossover and mutation techniques can be adapted to ge timproved performance.

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