Design and Implementation of Hybrid Algorithm   for Load Balancing in Cloud Computing Environment

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ABSTRACT: In this paper, a novel improved and efficient   scheduling algorithm is proposed and then implement in cloud computing environment with Cloudsim toolkit, in java language. By envisage the   cited   parameters in graphs and tables we can effortlessly classify that   the overall response time and data centre processing time is better   as well as cost is reduced in evaluation to the existing scheduling parameters. Our hybrid algorithm that is grouping of Throttled and Equal load share algorithm based on Ant Colony Optimization with modified that genetic algorithm reduction scheme that will assist to satisfy the request of consumer services. Efficient Throttled scheduling algorithm and compared it with the round robin, ESCE and Throttled scheduling to estimation response time, processing time, which is have an impact on cost.

KEYWORDS: Cloud computing, Particle swarm optimization, Classification algorithms, Algorithm design and analysis.

I. INTRODUCTION

Cloud computing is referred as a category of Internet based Computing. In cloud computing, cloud can be observation as Internet. It give convenience of resources on Internet for its complete user and it as well offer computing functionality on demand as a service so as to can be free or at cost. Consumer uses these services according to pay-as-you-use replica. Cloud computing intend to share data, resources and services between its users. Cloud computing offer infrastructure, software and platform as a service for dissimilar task that are submit by the customer. Software as Service normal offer application software functionality within a cloud computing surroundings. It offer dynamic and scalable virtualization resources throughout network service and assortment a virtual computing resource pool by include the large-scale computing storage resources. The resources require to be providing to the users in the form of service in this method. Due to the diversity of request in cloud computing platform and the heterogeneity of server node resources, a number of computers are overloaded and a quantity of computers are extremely light when the quick growth of network traffic and data traffic. consequently, we require a high-quality load balancing approach to regulate the server load, reduce communication costs and get better resource utilization. Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage. The present study about regulate the server road are frequently based on the migration of a particular virtual machine. though, among the appearance and expansion of cloud computing and big data, when dealing through the tasks of big data calculate by virtual machines in cloud computing, owing to the significance of data, the migration of a quantity of virtual machines dealing with association data will carry additional communication transparency among server in the process of migration and computation, and reduce the consumption rate of system resource. A load balancing approach based on data association in cloud computing is planned in this paper in view of the deficiency of existing research. This strategy describe and compute the relationship factor based on the internal relationship of data and the association of virtual machines dealing the similar data, and adjudicators the relationship among them and overall migration by construct load concentrated data group. The communication overhead among servers is concentrated and the utilization of the resources is better based on the strategy.
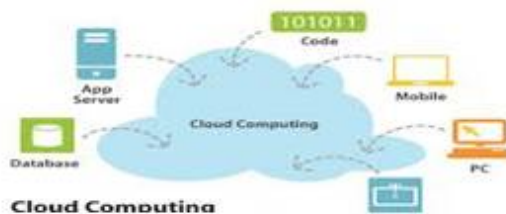
Figure 1: Cloud computing Environment

In this our hybrid algorithm that is grouping of Throttled and Equal load share algorithm based on Ant Colony Optimization with modified that genetic algorithm reduction scheme that will assist to satisfy the request of consumer services. Throttled scheduling to estimation response time, processing time, which is have an impact on cost. The rest of the paper is organized as follow. Section 2 presents the related works. Section 3 categorize and properly classify our load balancing problem proposed methodology. Section 4 presents the performance evaluation of our scheme compare with additional load balancing schemes in trace driven simulations. in conclusion, Section 5 concludes this paper and specify our future work.

II. RELATED WORK

There are numerous load balancing method specified by the researchers in excess of time to time similar have advantages more than and vice-versa. Distribute load of manifold network links to accomplish maximum throughput, minimize response time and to stay away from overloading. There are a lot of loads balancing algorithm such as Round Robin algorithm, , Equally Spread Current Execution Algorithm, Ant Colony algorithm, Throttled algorithm . Giving the comparative analysis by examination cost and performance. Load balancing is a well deliberate problem in distributed computer systems. earlier works believe the problem of statically balancing the loading order to reduce the signify job response time. For cloud, a lot of works have been proposed to achieve load balancing by VM migration from overloaded PMs to beneath loaded PMs. Swarm Based Algorithms [1] Swarm intelligence is the learning of computational system stimulated by the cooperative intelligence. Collective Intelligence [2] emerges during the cooperation of huge numbers of homogeneous agents in the surroundings. Examples comprise schools of fish, flocks of birds, and colonies of ants. Such intelligence is decentralized, self organize and distributed[3] every through an environment. In nature such systems are recurrently used to clarify problems such as successful foraging for food, quarry evasion, or colony re-location for load balancing. The information is typically stored throughout the give homogeneous agents, or is stored or communicate in the environment[4] itself such as during the use of pheromones in ants, dance in bees, and proximity in fish and birds. Types of Swarm Based Algorithm for Load Balancing: Genetic Algorithm[5] Artificial Bee Colony Particle Swarm Optimization, Ant Colony Optimization.

Shikha Garg el al[6] To convene the users enormous number of demands, there is a require of distributed explanation since almost it is not always probable or cost capable to handle one or additional idle services. a require of load balancing on its dissimilar servers or virtual machines. This investigate proposed an algorithm that focus on load balancing to diminish the situation of overload or beneath load on virtual machines that leads to get better the performance of cloud considerably. Comparative analysis is creature done with the assist of CloudAnalyst tool.

M.Meng et al[7] major aim of load balancing model is in order to get better performance and preserve stability

of processing so a lot of jobs in public cloud. Load balancing is reduce dispensation and response time which is contain impact on cost. This objective is attain by constructing high-quality balancing model for public cloud based on cloud partition through switch mechanism to prefer dissimilar strategy to advance the efficiency in public cloud surroundings.

Y. Ma et al[8] This paper present a narrative technique Memory investigation and Encoding (ME2), which primary identify helpful pages and then exploit Run Length Encode algorithm to quickly encode memory, to professionally decrease the total transferred data, total relocation time and downtime.

X. Zhang et al[9] This paper suggest a narrative VM migration technique, named Migration with Data Deduplication (MDD), which bring in data reduplication into migration. MDD utilizes the self-similarity of run-time memory image, use hash based fingerprints to discover identical and comparable memory pages, and employ Run Length Encode (RLE) to eradicate redundant memory data throughout migration.

III. PROPOSED METHODOLOGY

In the view of the greater than inadequacy, a load balancing approach based on data connection in cloud computing is proposed in this paper, the approach implements the load balancing of server form two distinguishing. Initially, the load thorough groups which are migrating are creating based on the relationship of data, this stride is the assortment of relocation unit. Secondly, in accomplish the load balancing of server, the load is migrate based on load concerted groups, this step is the selection of replacement server Round Robin Algorithm (RR). It is the simplest algorithm that develop the observation of time quantum or slice currently the time is separated into multiple slices and each node is particular a meticulous time quantum or time period and in this quantum the node will accomplish its operations. The assets of the service contributor are given that to the client on the beginning of this time quantum. In Round Robin Scheduling the time quantum play a extremely significant role for scheduling, since if time quantum is extremely huge then Round Robin Scheduling Algorithm is similar as the FCFS Scheduling. If the time quantum is tremendously too diminutive then Round Robin Scheduling is called as Processor Throttled Load Balancing Algorithm (TLB). In this algorithm the load balancer preserve an index table of virtual machines as glowing as their states. The client server primary creates a request to data centre to discover an appropriate virtual machine (VM) to perform the recommended job. The data centre queries the load balancer for allowance of the VM. The load balancer scans the index table from top awaiting the primary available VM is found or the index table is scan completely. If the VM is establish, the load data centre. The data centre converse the request to the VM recognized by the id. additional, the data centre recognize the load balancer of the novel allocation and the data centre revise the index table consequently. though processing the demand of client, if suitable VM is not found, the load balancer returns -1 to the data centre. The data centre queues the demand with it. When the VM absolute the allocated task, a request is recognized to data centre, which is additional apprised to load balancer to de- assign the identical VM whose id is previously communicate. The total execution time is predictable in three phases. In the primary phase the creation of the virtual machines and they will be inoperative waiting for the scheduler to agenda the jobs in the queue, once jobs are allocated, the virtual machines in the cloud will create processing, which is the subsequent phase, and lastly in the third phase the onslaught or the destruction of the virtual machines.
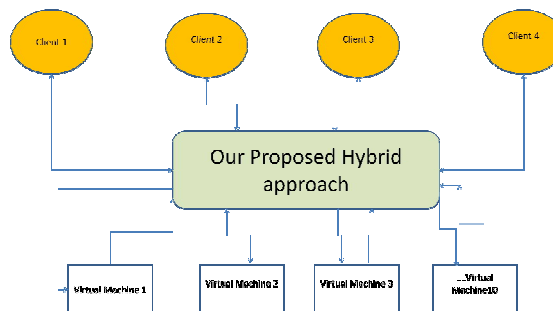

Figure 1: our proposed Hybrid approach

The throughput of the computing model can be predictable as the entirety number of jobs executed inside a time span without allowing for the virtual machine formation time and destruction time. The proposed algorithm will get better

the performance by provided that the resources   on demand, resulting in enlarged number of job executions and thus reducing the rejection in the quantity of jobs submitted. Our proposed is intended by creation alteration in the perception of hybrid load balancing algorithm. This proposed algorithm increases the exploitation of VM enhanced than Throttled and Active Monitoring. Work flow of algorithm is exposed with the assist of diagram which is easier to appreciate the perception of algorithm. CloudAnalyst tool is utilized for simulation reason which is GUI support software. Proposed algorithm is implemented in Java language and tested in huge extent cloud environment. Proposed hybrid load balancing algorithm create better result as to efficiently assign the coming request and maximize the response time in cloud environment. although response time is not enhanced than Throttled algorithm.Load balancing algorithm can as well be intended with additional technique like soft computing that will proficiently exploit virtual machines as well as it will minimize the response time. geologically locations of the task, resources and Quality of Service (QoS) parameters can be measured. Paradigm of parallel computing and high performance computing can be use to maximize the performance of load balancing algorithms. Throttled and Equal load share algorithm and Round Robin reduction system that will assist to satisfy the request of customer services.

IV. RESULT ANALYSIS

coordinated proposed Throttled VM Load Balancing Algorithm is implement in Java programming language. subsequent to the coding of algorithm, the code is compile by JDK version 6 and create class file is novel for implementation in CloudAnalyst tool. This file is added to the GUI component of construct simulation is CloudAnalyst tool. In primary case, VM are use through a single data center for configuration in CloudAnalyst tool. indicate that proposed Throttled VM Load Balancing algorithm present enhanced utilization of virtual machines somewhat than Active Monitoring and Throttled algorithms. As the proposed algorithm is intended subsequent to a quantity of alteration in Throttled algorithm, it nearly completely uses the virtual machines rather than Throttled. In Throttled, every time the availability of VM is checked from the very initial VM but in the convenience checking start from the subsequently to allocated VM. So by using a number of VM will run away from the circumstance of overload and below load. Round Robin allocate the virtual machines enhanced than proposed algorithm but proposed also The Cloud Analyst is a GUI based tool which is developed on CloudSim architecture. In regulate to analyze a variety of load balancing policies configuration of the a variety of components of the cloud analyst tool require to be set. We have set the parameters for the user base configuration, request deployment configuration, and data center configuration as shown in

The parameters used in this experimental Analysis are as go after:

1. Data Centers
2. UB (User Base)
3. VM (Virtual Machine)
4. Avg Response Time
5. Min Response Time
6. Max Response Time
7. Total Cost

The comparative analysis is summarized in the subsequent table.The simulation Duration is 10 min & the service broker policy is Closest Data Center.

Beginning more than table, it is clear that proposed throttled technique is additional efficient for the cloud load balancing. Correspondingly.
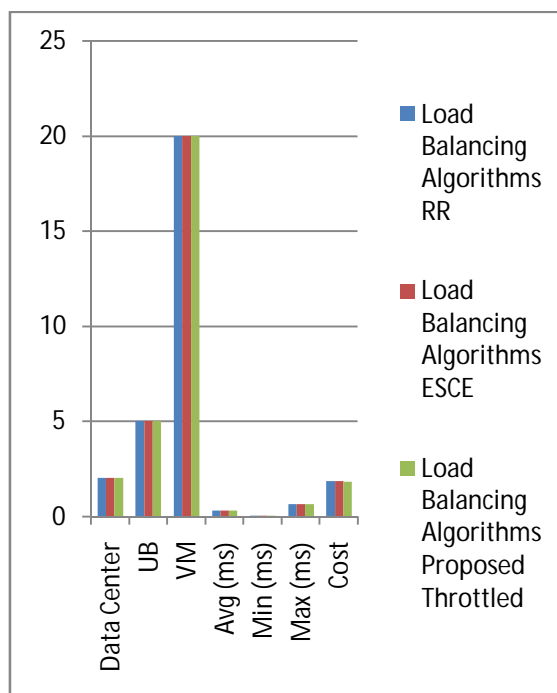
Figure 1: show the comparative analysis between proposed technique and existing algorithm

As made known in figure the location of user bases has been specific in six dissimilar regions of the world. We have in use three data centers to grip the request of these users. One data center is located in is positioned in region 0 , second in region1and third in region 2. On DC1, DC2 and DC3 number of VM 2 are 50. In arrange to analyze a variety of load balancing policies configuration of the a variety of component of the cloud analyst tool require to be complete We have set the parameters for the user base configuration, submission deployment pattern, and data center configuration as made known in correspondingly. As shown in outline the location of user bases has been distinct in six dissimilar regions of the world. We have taken three data center to handle

V. CONCLUSION

This paper propose a technique of load balancing based on data association in cloud computing. It considers the relationship amongst the data and virtual machine and the association amongst data. And it acquires improved the resource consumption and the load balancing degree, and at the similar time it reduces the standard response time and the communication transparency in the middle of servers in a degree. Throttled and Equal load share algorithm and Round Robin reduction scheme that will help to satisfy the request of client services.

In future, the performance of the load balancing algorithms is enhanced by with improved ACO algorithms, such as the Rank based Ant System and the Recursive Ant System. There are a lot of algorithms which have been establish work well with algorithm like honeybee, PSO or simulated annealing algorithm.

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BIOGRAPHY

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