A Review on Novel Approach for Load Balancing in Cloud Computing

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ABSTRACT
Cloud computing is an interconnection between the networks such as in private or public networks through internet in order to provide access to the application, data and file storage. It not only decreases the computational cost, hosting application, content storage and delivery rate. It is also a practical approach in which data centre is transferred from a capital-intensive set up to a variable priced environment. As compared to traditional concepts, cloud computing coveys the concept of the grid computing, distributed computing, utility computing or autonomic computing. When any virtual machine gets overloaded, fault may occur in the cloud environment. With the help of BFO algorithm, technique of adaptive task scheduling is proposed. Using this method, it becomes easy to transfer the task to the most reliable virtual machine. In this research work, the technique will be proposed which will select the most reliable virtual machine for the load balancing. The proposed improvement leads to reduce execution time and resource consumption.

KEYWORDS: Weight-based algorithm, Load Balancing, CloudSim

1. INTRODUCTION
The cloud provides the feasibility to the user so that it can access the information from anywhere. Therefore it removes the issue of location constrained as in the traditional computers a set up was required to access the information that is placed in other data storage device.

With the help of cloud physical relocation of human is minimized as it gets access its data storage from anywhere. As if somebody is using Cloud computing then their resources get shared along with that the cost is also getting shared. This helps user to spend only less cost as they have to pay on the basis of usage [1]. The applications are implemented on Public, Private or Hybrid clouds. In order to determine the impacts cloud integrators has been utilized and right path for the cloud for each organization. Despite its developing influence, concerns regarding cloud computing still remain. The benefits exceed the drawbacks and the model merits exploring [2]. Some common challenges are: Data Protection, Data Recovery and Availability, it includes Appropriate clustering and Fail over, Data Replication, System monitoring (Transactions monitoring, logs monitoring and others), Maintenance (Runtime Governance) and many more, Management Capabilities The management of platform and infrastructure is not easy as there are multiple cloud providers [3]. For some enterprises, features like Auto-scaling are considered as the crucial requirement. It has the great potential that it increases the scalability and load balancing features, Regulatory and Compliance Restrictions There are some countries that do not permit customer's personal information and other sensitive information to be leaked outside the state or country. To resolve this issue cloud providers have to made data centre or storage site within the country and it is not feasible to provide such a infrastructure separately.

Cloud computing gives various computing archetype to the numerous project, clients and online organizations, as the resources can be utilized on demand. The main objective of the cloud resource suppliers and consumers is the allocation of the cloud resources and accomplish the financial profit. The major issue in the cloud computing is the allocation of the resources as they are rarely distributed.

To Overcome all these challenges in cloud various techniques have been proposed from time to time. The different strategies are below:

Bio-Inspired Techniques
For the purpose of the search, there are various areas that are required such as connectionism, social behaviour as well as emergence. In these techniques, the area of biology, computer science as well as mathematics is covered. For the biologically inspired computing techniques these computational methods are considered as a broader view that provides various applications [4]. In order to study the IT oriented paradigm of cell computation or information processing, various genetic algorithms and evolutionary algorithms are proposed by many researchers. This technique is considered as a powerful tool. For the validation of the theories of biological evolutions and natural inspirations, various algorithms are proposed using mathematical optimization. This technique is not very efficient as it is applicable at the small level and cannot be utilized for the larger projects [5]. The main disadvantage is misplaced of prominent genotype-phenotype idea of the evolutionary algorithm.

Artificial Bee Colony Optimization

The artificial bee colony algorithm is an optimization algorithm based on the meta-heuristics in which various optimal numerical solution has been find out among a substantial number of alternatives. This process is followed while trying to tackle NP difficult problems. In this ABC includes the three groups of the bee in the colony of the artificial bee such as employed bees, onlookers and scouts. Onlookers is referred as the behaviour, in which bee took the decision for a food source. When it goes to previously visited place it is named as employed bee. The random search carried out by the bee is referred as scouts. In the optimization problem, the position of a food source represents a possible solution and the quality of the solution is described by using nectar amount of a food source. The swarm of the bees is moved in the random direction in the two-dimensional search space. When a nectar target is discovered bees start interacting with each other and find out the optimal solution for the problems obtained from the intensity of these bee interactions.

In this algorithm, potential food source are initialized for the vector of the population. Initially, a new food source is searched by the bees randomly. After the identification of the food source, the fitness of the obtained food is identified and calculated. Further if another food source is discovered by the employed bees having a greater fitness, they utilized the new sources and deserted the existing one. The fitness information is transferred to the onlooker bees by the employed bees as food selection by the onlooker bees done on the basis of the probability of the food occurring [6]. Their solutions are rejected, if the fitness of the food source is not proved by the employed bees.

Intelligent Water Drops Algorithm (IWD)

Intelligent Water Drops Algorithm is proposed by Hamed Shah-hosseini that is mainly based on the population based strategy. The major inspiration to this system is the process of Natural River systems in which actions and reactions are occur between water drops in the river. It also follows the changes in the environment such as river is flowing [7]. The main logic behind this method is the use of the behavior of the water drops, therefore, an artificial water drop is developed by the researcher that possess some properties of the natural water drop. This Intelligent Water Drop has two important properties:

The amount of the soil it carries now, Soil (IWD).

The velocity that it is moving now, Velocity (IWD).

The main problem is the environment from which the water flows, hence it is important to take care of the environment for this purpose.

2. Literature Review

Ji Su Park [1]: With the fast spread of mobile devices, a huge amount data is generated in a mobile environment. The distributed processing technologies such as Map Reduce are applied to mobile devices, thanks to the improved computing power of mobile devices. However, mobile devices have several problems such as the movement problem and the utilization problem. Especially, the utilization problem and the movement problem of mobile devices cause system faults more frequently because of dynamic changes, and system faults prevent applications using mobile devices from

being processed reliably. In this author proposed scheme, mobile devices are separated into groups by cut-off points based on entropy values. He also proposes a two-phase grouping method in order to reduce the overhead of group management. The experimental result shows that our algorithm outperforms traditional grouping techniques with maintaining stable big data processing and managing reliable resource.

Liang Q [2]: In this work author puts forward a reconfiguration framework based on a request prediction, which anticipates the application request volume in advance. To determine the objective of relatively optimal configuration, it can work out the allocation scheme which can improve the resource utilization ratio as well as lower energy consumption. In addition, a concept of Utility Ratio Matrix (URM) is put forward to represent allocations of hosts and Virtual Machines (VMs), and a reconfiguration algorithm based on request prediction is also presented. The algorithm will predict the application requests so as to work out the allocation scheme in advance. The algorithm can separate the reconfiguration computing from the real allocation so that it can avoid a time delay between the reconfiguration result and the varied demands, and can also reduce the energy consumption in data centre. The corresponding analysis and experimental results indicate the feasibility of the reconfiguration algorithm in this paper.

Christian V [3]: As scientific application require large computing power, traditionally exceeding the amount that is available within the premises of a single institution. In this author developed Aneka's deadline- driven provisioning mechanism, which is responsible for supporting quality of service (QoS)-aware execution of scientific applications in hybrid clouds composed of resources obtained from a variety of sources. Experimental results evaluating such a mechanism show that Aneka is able to efficiently allocate resources from different sources in order to reduce application execution times

3. Proposed Work

In the cloud computing technology, task scheduling policy is considered as a crucial component that provides the Quality of Service to the whole cloud computing systems. A trade-off between user requirements and resource utilization is done with the help of task scheduling strategy. In order to allocate work, scheduling is considered as the resource method. The main objective of this research work is

To study and analyzed the existing series of strategies based on multi-objective task scheduling and to understand their limitations.

To design and implement improved optimization algorithm based on Bacterial foraging technique for task scheduling. To increase the speed of processing by exploitation full resources and to achieve high correctness and improved identification rate.

To validate the proposed algorithm
In order to resolve the node failure within the cloud networks, the BFO algorithm is proposed in this research work. There are number of nodes available in the present algorithm. On the basis of failure rate and least execution time utilized, the candidate node will be selected form these nodes. A threshold value is set here by the master node in

which there are two parameters to be considered which are failure rate and execution time. The master node selects the candidate node on the basis of the node that has equal to and less failure rate as well as minimum execution time. . Once the candidate node is chosen, the execution of tasks will be initiated. The numbers of tasks to be executed within this scenario are also needed to be entered here. Failure will occur at the point where one task moves from its location during the execution of task. a novel technique is proposed in this paper in order to solve this issue such that the mobility of a node does not cause any kinds of failure within the networks.

4. Conclusion and Future Work

There is a need to increase the number of data centers according to the needs of host in order to ensure the Quality of Service within the network. There will be an increment in the energy being consumed by the network at fixed rate as the number of data centres increase. Thus, the QoS can be ensured at the required level through this. In this research work, the BFO technique will be optimized for the virtual machine migration. The virtual machine which is maximum reliable on that machine task will be migrated. The proposed improvement leads to reduce execution time and resource consumption
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