Advanced Extended Cloud Security

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ABSTRACT

Cloud computing enables a great range of users to access spread, scalable, virtualized hardware and/or software infrastructure over the Internet. Multicloud is a methodology to allocate workload across many computers or other resources over the network links to attain best resource use, make the most of throughput, smallest response time, and avoid overload. It presents a load balancing Task Scheduling algorithms or technique in cloud computing. Efficient task scheduling mechanism should meet user's requirements and improve the resource utilization, so as to enhance the overall performance of the cloud computing environment. In order to solve this problem, considering the new characteristics of cloud computing and original adaptive genetic algorithm (AGA), a new scheduling algorithm based on double-fitness adaptive algorithm-job spanning time and load balancing genetic algorithm (JLGA) is established.

Keywords: **Cloud Computing, Fitness Function, Chromosomes, Multicloud, Task Scheduling.**

ARTICLE INFO

I. INTRODUCTION

Cloud computing is a new computing mode. It involves a large number of computers connected through a communication network such as the Internet, similar to utility computing. Cloud computing has the advantage of delivering a flexible, high-performance, pay-as-you-go, on-demand service. Operators should guarantee to the subscribers and stick to the Service Level Agreement (SLA). It will definitely lead to unsatisfying if the jobs panning is too long. Besides, the cloud computing platform also needs to dynamically balance the load among the servers in order to avoid hotspot and improve resource utility [1]. Therefore, how to dynamically and efficiently schedule tasks and meet subscribers becomes a critical problem to be solved.

Basically cloud computing consists of distributed computing, utility computing and grid computing. Mainly one issue face by user in cloud computing is that user does not knows which part of infrastructure the services are located. User only pays for the services which they requested through specific infrastructure [2]. Cloud infrastructure provides access to user for respective service only on demand. These services include which can be providing over the network and can be accessed over the internet. To reduce response time of services and implementation cost we can use scheduling algorithms. For efficient resource utilization and for assignment of job scheduling algorithms are mainly used. In one hand, it should reduce the execution time and from the other hand, it should reduce the execution time. For achievement of both tasks we have to use best fit approach which consists for large strength resources we can assign task of high complexity as well as large length [3, 4]. Now a day's most of the cloud job scheduling focuses on intelligent approaches like Genetic algorithm [5] and Fuzzy theory [6].The rest of this paper is as follows: in the next section we provide methods; In this Section, we take a brief look on genetic algorithm and Fuzzy logic, In Section 3 we describe our designed approach and system architecture. Finally, in Section 4, we make a conclusion.

II. METHOD

Main component of Genetic algorithm is chromosomes, set of chromosomes called population. Fitness values of Chromosomes are calculated by using fitness function. Next step is to find two best chromosomes on which we are applying crossover operations. Using standard genetic algorithm mutation operations will be performed. Output of this operations consist of new choice which are present at

some positions. Finally the algorithm adds the new chromosome to the population. This process will continue up to termination condition occur [5]. Fuzzy theory is a reason which is less harsh than the computation computers frequently execute. Use of fuzzy logic done in distributed system like grid and cloud scheduling as well as for trust management and resource discovery [6]. Fuzzy Logic is a particularly good option for many control problems such as examination of knowledge by utilizing fuzzy sets, each of which can show a linguistic phrase such as "Bad", "Medium", etc. [7]. In designed approach with the help of fuzzy theory, By modifying genetic algorithm; fuzzy system can be used in fitness step and cross overstep. Using fuzzy theory in genetic algorithm we can reduce the iteration of producing the population and handing over the suitable resources to the jobs based in the node capacities and length of the jobs. Through this modified algorithm we can get best chromosomes in a few computations. Main notion in every large scale computing is load balancing that assures every computing resource utilized in well-organized way. Researchers recently focus on genetic algorithm and fuzzy theory. Reason behind this is their intelligence and inferred parallelism [5, 6]. Particularly, authors in [8] developed cloud scheduling proceed for VM load balancing with the assist of Genetic Algorithm. Constancy and convenience are some features in Cloud which should be measured in designed system. The authors reach this feature successfully by civilizing overall system constancy and convenience. Authors in [9], illustrate several job scheduling algorithm and evaluate between these algorithms. As it is mentioned in this paper, a good quality cloud job scheduling algorithm be supposed to schedule the resources to optimize the use of the resource. Various scheduling algorithms are accessible for resource scheduling but each one has its own limit. These algorithms stand for optimum or no optimum solution for the problems. At this time, we require more precise algorithm for resource scheduling which is the major research challenge. In case of Ant Colony Optimization (ACO) when more resources are occupied, ACO produce colony thus follow less apparently pheromone trail from another colony. Authors in [10] planned a job oriented based model for cloud resource scheduling. This model assigns jobs to the resources according to the rank of the job. This paper also discusses the examination of resource scheduling algorithm such as time parameter of Round Robin, Pre-emptive Priority and Shortest Remaining Time First.

In [11], authors proposed a model to deal with the job scheduling problems for a group of cloud user requests. Each data center has dissimilar services with various resources. This plan assumes resource stipulation in gas and significant issue for job scheduling. The main goal of this model is reducing the average tardiness of association requests. This paper present four merged scheduling algorithms and used to schedule virtual machine on data centers. Of the four methods, the method integration Resource Based Distribution technique and Duration Priority practice have represent the best presentation becoming the minimum delay while approval to the problem constraints. In [12], proposed a Genetic algorithm based job scheduling in which there is a fitness function which separated into three sub-fitness function and then linear combination of these sub fitness value is carry out for obtaining the fitness value. This paper uses a pre-migration approach which is based on three load dimension: CPU use, network throughput, disk I/O speed. TO achieve a nearly optimum solution this plan applies the hybrid genetic algorithm merge with knapsack problem with multiple fitness. The author claims that the algorithm can get the goal of raising resources utilization efficiency and lower energy use.

III. DESIGNED APPROACH

In our designed approach we are using genetic algorithm and we are adding new support by using fuzzy theory to reduce iteration of producing the population. Here we are simply adding one easy step i.e. calculating Highest Common Factor of all available sizes of cloud. We have to calculate H.C.F in every cycle which can help in allocating task to clouds efficiently and also handle load on every cloud in efficient way. Task allocation on every cloud is done by following formulae.

$$\text{Task allocated on cloud(j)} = \left\lceil \frac{\text{size of cloud } j}{HCF(i)} \right\rceil$$

Fitness function is used for calculating fitness of cloud. Here fitness function calculates size of cloud i.e. memory of cloud. More the memory of cloud more the fitness function value of that cloud. This fitness function used for task allocation.
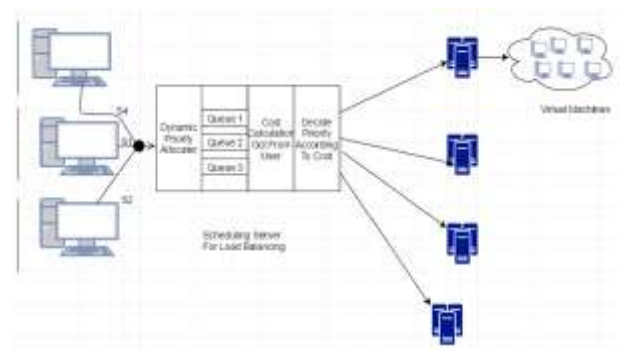

Fig 1. System Architecture

Now we have one problem that is of scheduling which we are solving by considering scheduling parameters such as time parameters of Round Robin, Pre-emptive Priority and Shortest Remaining Time First. System Diagram shows brief description of designed system in which mainly five components are there. They are dynamic priority allocator, Execution Queues, fitness function calculation, decide priority according to fitness, virtual memory.

IV. CONCLUSION

In this paper we used genetic algorithm as the root of our approach and we change it with the support of fuzzy theory to trim down the iteration of producing the population. We describe two types of chromosomes with dissimilar QOS parameters; Then with the support of fuzzy theory we gain the fitness value of all chromosomes for the mentioned two types. The new approach with the use of fuzzy theory

changes the customary genetic algorithm and modify system routine in terms of implementation cost about 45% and total implementation time about 50% which are the main aim of this research.

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