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# Load Balancing and Task Scheduling Using Genetic Algorithm

#1Pranjali Dube, #2Tabasssum Nakhawa, #3Sruthi Ramesh, #4Priyanka Kolte

1pranjalidube21@gmail.com
2tabassum55@gmail.com
3saisruthi1231@gmail.com
4priyankakolte399@gmail.com

#1234Department of Computer Engineering,

Savitribai Phule Pune University
KJ College Of Engineering & Management Research,
Pune, India.

**ABSTRACT**

**Cloud computing enables a large range of users to access scattered, scalable, virtualized hardware and/or software infrastructure over the Internet. Multi cloud is a methodology to allocate workload across many computers, or other resources over the network links to achieve optimal resource utilization, make the most of throughput, minimum response time, and avoid overload. It presents a load balancing Task Scheduling algorithms or technique in cloud computing. Efficient task scheduling mechanism should meet users 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 adaptive algorithm-job spanning time and load balancing genetic algorithm (JLGA) is established.**

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## I. INTRODUCTION

The latest vision of large distributed computing is "Cloud". Cloud based multimedia system (CMS) gained momentum as there are large number of users. Cloud computing is internet based computing, whereby shared resources, software and information are provided to computers and other devices on-demand, like a public utility. Recent the most burning topic is Cloud storage for the IT user. Because when a user uses a personal or professional computer for a great purpose, then they must have some precious files, for which that man is ready to invest more to protect the file. As the scope of cloud scales up, cloud computing service suppliers needs handling of gigantic requests. Thus in spite of glorious future of Cloud Computing, many actual problems still essential to be explored for its perfect awareness. One of these concerns is Load balancing. Cloud load balancing is the process of distributing workloads and computing resources in a cloud computing environment. Load balancing allows to manage application or workload demanded by users by allocating resources among multiple computers, networks or servers. Cloud computing is a new computing model in todays world. Cloud computing involves a large number of computers connected within a communication network. It has the ability of delivering a flexible, high-performance, pay-as-you-go, on-demand services. Cloud computing operators should guarantee to the subscribers and stick to the Service Level Agreement (SLA), which will definitely lead to unsatisfying if the job spanning is too long. Besides, the cloud platform also needs to dynamically balance the load among the servers in order to avoid hotspot and improve resource utility. Therefore, to get to know how dynamically and efficiently schedule tasks and meet subscribers becomes a critical problem to be solved. To solve the problem of load

 

balancing, every cloud giants should have their own solutions. Like Google has Map-Reduce scheduling mechanism and IBM blue cloud has Xen and Hadoop clusters, whose core algorithm is the same as Google.

Tasks scheduling in cloud is a NP-complement problem with time limit. That means it is seldom impossible to search out a reasonable solution in polynomial time. In this paper, we proposes the job which is least time consuming and load balancing genetic algorithm which finds the optimal task allocation sequence in dynamic cloud system. It minimize the makespan of tasks and balance the load of the whole system. In this paper, we ensuring correct access management (authentication, authorization, and auditing). Network level migration, in order that it needs minimum value and time to guide carefully to the employment. It also offers correct security to the info in transit and to the info at rest. It also shows that data lineage, knowledge origin and unintended speech act of sensitive data is feasible. Using genetic algorithm we can increases the performance and efficiency of all server.

## II. LITERATURE SURVEY

1. "Load Balancing Task Scheduling based on Genetic Algorithm in Cloud Computing"(2014)

This paper mentioned regarding the scheduling and load balancing. To solve the matter, considering the new characteristics of cloud computing and original adaptive genetic algorithmic program (AGA) a brand new scheduling algorithm supported double-fitness adaptive algorithm-job spanning time and load balancing genetic algorithm (JLGA) is established. Then compare the performance of JLGA with AGA through simulations.

2. "Hybrid Job Scheduling Algorithm for Cloud Computing Environment"(2014)

In this paper with the assistance of genetic formula and fuzzy theory, describe a hybrid job planning approach,that take under consideration the load feat of the system and reduces total execution time and execution value. The main goal of the analysis is to assign the roles to the resources with considering the VM unit of measuring and time-span of jobs. The results of the experiments shows the potency of the planned approach in term of finishing time, execution value and average degree of inequity.

3. "Host Scheduling Algorithm using Genetic Algorithm in Cloud Computing Environment"(2014)

This paper represents that cloud computing may be a paradigm within which IT (information technology) application offer as a service. Cloud computing permits users to utilize the computation, storage, knowledge and services from round the world in commercialize manner. In cloud atmosphere, scheduling is that the major issue. scheduling is responsible economical utilization of the resources. during this paper, a scheduling model based on minimum network delay using Suffrages Heuristic coupled Genetic algorithm for scheduling sets of freelance jobs algorithm is projected, the target is to reduce the make span.

## III. EXISTING SYSTEM

Cloud Computing is the utilization of pool of resources for remote users through internet that can be easily accessible, scalable and utilization of resources. To attain maximum utilization of resources the tasks need to be scheduled. The problem in scheduling is allocating the correct resources to the arrived tasks. Dynamic scheduling is that the task arrival is uncertain at run time and allocating resources are tedious as several tasks arrive at the same time.

The running generation of world, cloud computing has become the most powerful, chief and also lightning technology. IT based companies has already changed their way to buy and design hardware through this technology. It is a high utility which can also make software more attractive. Load balancing research in cloud technology is one of the burning technologies in modern time.

## IV. PROPOSED SYSTEM

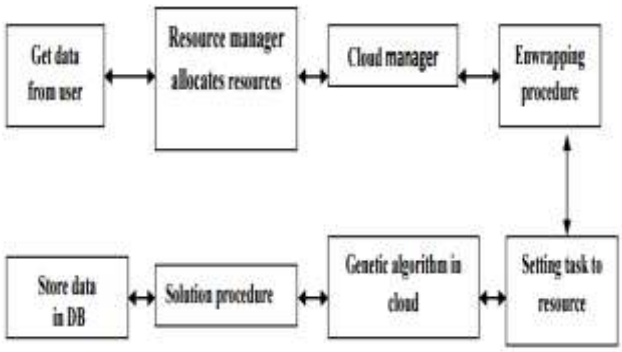


Fig 1. Process Flow

Start describes that system being ready to run. Once the system starts, user will be logging on the system or cloud atmosphere. If the user is already registered ,then he or she enters into cloud environment otherwise initial registration then login. Check Authentication want to certify user that enters is the member of this atmosphere or not. Then decide the algorithm and process the nodes to maintain the load.

Once the node is processed, then evaluate the resources like CPU time, Memory usage, Flow time, Makespan time, Bandwidth etc. and at the end compare the algorithms like proposed algorithm (Enhanced Genetic Algorithm), Ant Colony Optimization (ACO) and then stop the whole process.

 

## V. CONCLUSION

Load Balancing in cloud computing tended to use the direct tasks of users as the overhead application base. Load Balancing Based Task Scheduling is a way of measuring both the cost of the objects and the performances of activities and it can measure the cost more accurate than traditional ones in cloud computing. In this project we introduces an optimized algorithm for task scheduling based on Load Balancing based scheduling in cloud computing and the implementation of it.

## REFERENCES

[1] G. Chen,W. He, J. Liu, S. Nath, L. Rigas, L. Xiao, and F. Zhao, "Energyaware server provisioning and load dispatching for connection-intensive internet services.," in *NSDI*, vol. 8, pp. 337–350, 2008.

[2] Y. Jin and K. Li, "An optimal multimedia object allocation solutionin multi-powermode storage systems," *Concurrency and Computation: Practice and Experience*, vol. 22, no. 13, pp. 1852–1873, 2010.

[3] W. Lin, C. Liang, J. Z. Wang, and R. Buyya, "Bandwidth-aware divisible task scheduling for cloud computing," *Software: Practice and Experience*, vol. 44, no. 2, pp. 163–174, 2014.

[4] J. Gu, J. Hu, T. Zhao, and G. Sun, "A new resource scheduling strategy based on genetic algorithm in cloud computing environment.," *Journal of Computers*, vol. 7, no. 1, 2012.

[5]J. Dean and S. Ghemawat, "Mapreduce: simplified data processing on large clusters," *Communications of the ACM*, vol. 51, no. 1, pp. 107–113,2008.

[6] K. Chen and W.-M. Zheng, "Cloud computing: system instances and current research," *Journal of Software*, vol. 20, no. 5, pp. 1337–1348, 2009.

[7] H. Kllapi, E. Sitaridi, M. M. Tsangaris, and Y. Ioannidis, "Schedule optimization for data processing flows on the cloud," in *Proceedings of the 2011 ACM SIGMOD International Conference on Management of data*, pp. 289–300, ACM, 2011.

[8] M. D. de Assunc¸ ˜ao, A. di Costanzo, and R. Buyya, "A cost-benefit analysis of using cloud computing to extend the capacity of clusters,"*Cluster Computing*, vol. 13, no. 3, pp. 335–347, 2010..

[9]S. T. Maguluri, R. Srikant, and L. Ying, "Stochastic models of load balancing and scheduling in cloud computing clusters," in *INFOCOM,2012 Proceedings IEEE*, pp. 702–710, IEEE, 2012.

[10] X. Liu, K. Li, G. Min, K. Lin, B. Xiao, Y. Shen, and W. Qu, "Efficient unknown tag identification protocols in large-scale rfid systems,"*Parallel and Distributed Systems,IEEE Transactions on*, 2014.

 