A Review on Existing Job Scheduling Techniques Over Cloud

Parminder Singh [1], Amandeep Kaur[2]
[1]Student of Masters of Technology, [2]Assistant Professor,
Department of Computer Science and Engineering, Desh Bhagat University Mandi Gobindgarh, India

Abstract: **Cloud computing is one the latest technology. It increases the working efficiency of cloud environment. Job scheduling means allocate certain job at particular time and particular resources. The main aim of job scheduling to distribute the system load, improve system performance, proper utilization the available resource reduce the cost and execution time. It is play important   role in cloud computing. It reduce the energy consumption require a minimum power. This paper provides a survey various on job scheduling algorithm. In existing literature, researcher has applied many Meta heuristic algorithms to solve the problem in job scheduling over the cloud. A suitable job scheduling algorithm must consider priority of jobs. In this paper various scheduling algorithm has been studied to indicate the recent trends for using meta-heuristic techniques over cloud computing.**

Keywords - **cloud computing, job scheduling, cloudsim**

I.   INTRODUCTION

Cloud computing is the use of computing resources as a service via internet. It can say that, the cloud computing is basically derived from the word internet, which is an evolving technology,Cloud computing enables us to access through internet and also enables secure sharing of resources. It has started to gain insight in corporate data centers. In recent years, cloud computing is including grid computing because utilization of virtualization at datacenter could increase. Cloud computing gives services which is necessary for their clients without any change in existing infrastructure .Due to the increasing demand of cloud services, size of the data center is exponentially increasing and more servers are needed to full-fill this demand. one of the major issue is that data center generates more heat as more servers are required at data centers.to overcome this issue more cooling devices are required to keep temperature normal and resulting in more energy consumption. Therefore, this is an important research area of Green Cloud Computing and hence there is a need of an energy efficient resources allocation at the data center in order to reduce the total energy cost. The cloud computing service models are Software as a Service (SaaS), Platform as a Service (PaaS) and Infrastructure as a Service (IaaS). In Software as a Service model, a pre-made application, along with any required software, operating system, hardware, and network are provided. In PaaS, an operating system, hardware, and network are provided, and the customer installs or develops its own software and applications. The IaaS model provides just the hardware and network; the customer installs or develops its own operating systems, software and applications. Cloud Computing helps to reduce hardware and maintenance cost because there is no need to be installed any application on user's computer. Cloud provides a large resource pool which allow user to obtain configure and accesses information according to their need. The Cloud has large scale platform i.e. The Google Cloud has owned more than one million server. It can produce various applications supported by cloud, and one cloud can support different applications running it at the same time

1.1 Job Scheduling

 Job scheduling is major activities performed in the cloud computing. Cloud computing is one the latest technology. It increases the working efficiency of cloud environment. job scheduling means allocate certain job at particular time and particular resources .It is biggest problem because some time multiple request are come at same time, one system and system cannot work then many problem is occurred like system delay the result ,system not work properly etc. The main aim of job scheduling to distribute the system load, improve system performance, proper utilization the available resource reduce the cost and execution time. It is play important   role in cloud computing.It reduce the energy consumption require a minimum power. It is only a tasks performed in order to gain maximum profits. It includes the NP-complete problem, when the number of user is increase. It is policy that helps to proper utilization the virtual machine. It handles the many requests at a same time because the problem is divided into sub tasks and measured the average completion time. Scheduling is used to maximize the efficiency of the cloud. The objective of job scheduling algorithms to proper utilization the resources and managing the load between the resource and minimum execution time .In the scheduling system target is different, usually adopt a different scheduling algorithm according to requirement. There has been various types of scheduling algorithm exist in distributed computing system. Most of them can be applied in the cloud environment with suitable verifications. The main advantage of job scheduling algorithm is to achieve a high performance computing and the best system throughput. Traditional job scheduling algorithms are not able to provide scheduling in the cloud environments. There are various job scheduling techniques available such as user Level Scheduling, Static and Dynamic Scheduling, Heuristic Scheduling, Real Time Scheduling.

II.   RELATED WORK

Boloor, Keerthana et al. [1] this paper proposed the cloud storage model for cloud computing. This work presented an Efficient Cloud Storage Model for Cloud Computing Environment. Cloud computing is a new tread of information technology and computer system.

Bonabeau, Eric, Marco Dorigo [2] an energy efficient resource management in virtualized cloud data centers has been presented. This approach helps to minimize the cost and gives essential quality of services. Virtual network topologies established between VMs and thermal state of computing nodes. This approach has presented a decentralized architecture of the energy aware resource management system for Cloud data centers.

Chang, Fangzhe, Jennifer Ren et al. [3] proposed A Particle Swarm Optimization-based Heuristic for Scheduling Workflow Applications in Cloud Computing Environments Cloud computing environments facilitate applications by providing virtualized resources that can be provisioned dynamically.

Neeraj Kumar Sharma and G. Ram Mohana Reddy et al. [4] this paper deals with the design of an energy efficient algorithm for optimized resources allocation at data center using combined approach of Dynamic Voltage Frequency Scaling (DVFS) and Genetic algorithm (GA). This work proposed genetic algorithm for energy efficient virtual machine allocation at data center.

Deepak puthal,sambitmishra et al.[5] this paper discussed the emerging research issues that pursued the advance scientific features of cloud computing with layer wise classification of the cloud services, and highlighted the subsequent guidelines of research facing the both industry and academic community. In this study cloud computing architecture and security problem in cloud computing based on its service layer has been discussed.

Zahra Bagheri, Kamran Zamanifaret al.[6] In this paper, an energy-aware resource allocation strategy is presented for real-time tasks in cloud environments. The simulation results demonstrate that the proposed algorithm improves the performance of data center in terms of energy consumption and deadline constraints in a significant manner.

A.PaulinFlorence et al. [7] proposed energy aware cloud computational cloud. In this paper, a new energy aware load balancer is proposed and then implemented in cloud simulator. Proposed approach is implemented by java language. It minimizes energy consumption and thus proves to be more efficient in terms of energy consumption.

Mahmoud, Aminu Abdulkadir et al. [8] in this paper proposed an efficient algorithm based on multi-criteria strategy. The algorithm consists of two main phases. The proposed algorithm enhances jobs scheduling and resource load balancing by ensuring an efficient utilization of the available resources.

Rajiv Ranjan, and Rodrigo N. Calheiros [9] in this paper Survey on Job Scheduling algorithms in Cloud Computing. This paper surveys the existing different type of job scheduling algorithms in cloud computing environment and summarizes some method to improve the performance.

Chen, Huangning, and Wenzhong Guo et al. [10] In this paper, a soft real-time task scheduling algorithm has been proposed based on particle swarm optimization approach for cloud computing. Simulation results show the proposed algorithm can effectively minimize deadline missing ratio, maximize the profit of cloud service provider and achieve better load balancing compared with baseline algorithms.

Ma, Juntao, Weitao Li et al. [11] this paper proposes a novel dynamic task scheduling algorithm based on improved genetic algorithm. On the basis of the genetic algorithm, the proposed algorithm gives full consideration to the dynamic characteristics of the cloud computing environment.

Moganarangan, N., R. G. Babukarthik et al. [12] presented a new Hybrid algorithm combining the benefits of ACO and cuckoo search algorithm. Performance of the Hybrid algorithm is considerably increased from 45 tasks onward when compared to ACO. Make span of Hybrid algorithm based on number of tasks is compared with ACO algorithm.

Singh, LalShriVratt, and Jawed Ahmed [13] in this paper task scheduling and resource allocation algorithms has been proposed which give the optimum result in cloud computing environment. The new algorithm helps in the good understanding of resource allocation and task scheduling options.

III. CONCLUSION

Scheduling has been one of the major issue in the management of the tasks related to various application executed over the cloud environment. The major focus of scheduling is to allocate resources to the optimal job over the cloud computing. In this paper var ious scheduling algorithm has been covered to show the recent trends for using metaheuristic techniques to over cloud computing. Most of thealgorithms has used a jobs or task related parameters to calculate the optimal job for the current running environment of cloud. Futurework will cover some more issues related to task scheduling and advance scheduling heuristics.

REFERENCES

[1] Boloor, Keerthana, et al. "Heuristic-based request scheduling subject to a percentile response time sla in a distributed cloud." Global Telecommunications Conference (GLOBECOM 2010) IEEE, 2010.

[2] Bonabeau, Eric, Marco Dorigo, and Guy Theraulaz. Swarm intelligence: from natural to artificial systems. No. 1.Oxford university press, 1999.

[3]Chang, Fangzhe, Jennifer Ren, and Ramesh Viswanathan."Optimal resource allocation in clouds." Cloud Computing (CLOUD), 2010 IEEE 3rd International Conference on.IEEE, 2010.

[4] Sharma, Neeraj Kumar, and G. Reddy. "Novel energy efficient virtual machine allocation at data center using Genetic algorithm." In *Signal Processing, Communication and Networking (ICSCN), 2015 3rd International Conference on*, pp. 1-6. IEEE, 2015.

 [5] Puthal, Deepak, B. P. S. Sahoo, Sambit Mishra, and Satyabrata Swain. "Cloud computing features, issues, and challenges: a big picture." In*Computational Intelligence and Networks (CINE), 2015 International Conference on*, pp. 116-123. IEEE, 2015.

[6] Bagheri, Zahra, and Kamran Zamanifar. "Enhancing energy efficiency in resource allocation for real-time cloud services."In *Telecommunications (IST), 2014 7th International Symposium on*, pp. 701-706. IEEE, 2014.

[7] Florence, A. Paulin, and V. Shanthi. "Energy aware load balancing for computational cloud." In *Computational Intelligence and Computing Research (ICCIC), 2014 IEEE International Conference on*, pp. 1-3. IEEE, 2014.

[8] Mahmoud, Aminu Abdulkadir, M. Zarina, Wan Nor Shuhadah Wan Nik, and Fadhilah Ahmad. "Multi-Criteria Strategy for Job Scheduling and Resource Load Balancing in Cloud Computing Environment." *Indian Journal of Science and Technology* 8, no. 30 (2015).

[9] Buyya, Rajkumar, Rajiv Ranjan, and Rodrigo N. Calheiros. "Modeling and simulation of scalable Cloud computing environments and the CloudSim toolkit: Challenges and opportunities." High Performance Computing & Simulation, 2009.HPCS'09.International Conference on.IEEE, 2009.

[10] Chen, Huangning, and Wenzhong Guo. "Real-Time Task Scheduling Algorithm for Cloud Computing Based on Particle Swarm Optimization." In*Cloud Computing and Big Data*, pp. 141-152. Springer International Publishing, 2015.

[11] Ma, Juntao, Weitao Li, Tian Fu, Lili Yan, and Guojie Hu. "A Novel Dynamic Task Scheduling Algorithm Based on Improved Genetic Algorithm in Cloud Computing." In *Wireless Communications, Networking and Applications*, pp. 829-835. Springer India, 2016.

[12] Moganarangan, N., R. G. Babukarthik, S. Bhuvaneswari, MS Saleem Basha, and P. Dhavachelvan. "A novel algorithm for reducing energy-consumption in cloud computing environment: Web service computing approach." *Journal of King Saud University-Computer and Information Sciences* 28, no. 1 (2016): 55-67.

[13] Singh, LalShriVratt, and Jawed Ahmed. "A Greedy Algorithm For Task Scheduling & Resource Allocation Problems In Cloud Computing." *International Journal of Research & Development in Technology and Management Science–Kailash* 21, no. 1 (2014).