Swati Ahlawat al. International Journal of Institutional & Industrial Research ISSN: 2456-1274, Vol. 2, Issue 2, May-August 2017, pp.17-21

Review of scheduling mechanism used in cloud computing- QoS analysis

Swati Ahlawat

M. Tech Scholar, Dept of Computer Science, NorthCap University Gurugram

(Formerly ITM University)

Abstract: **Cloud Computing provides computing moreover like a service instead of production like software information, shared resources, etc...It can be used for assigning tasks or the jobs to the present structure resources such as hardware and software. The scheduling algorithms are used for assigning the tasks to machines. In Job scheduling process by using fuzzy logics, the user's tasks are classified and they are based on Quality of service (QoS) parameters like execution size and time.**

Keywords: **cloud computing, scheduling mechanism, QoS analysis.**

1. Introduction

Cloud computing means accessing resources over internet sitting anywhere either at your home on the desktop or in your workplace's network in a complete seamless way. It looks as if a different company is fulfilling your request over the internet. User is not concerned about the location of software or hardware; these are present in some cloud represented by internet.

This is a type of computing doesn't have local servers or personal hardware and software rather it relies on sharing resources used for computing. Cloud computing is like grid computing. In grid computing new programming cycles of all the computers in a environment are locked together to compute problems rather than using stand alone machine.

The 'cloud' word is used as an alternate word for "the Internet," therefore cloud computing relates to Internet based computing that works like an internet environment. In this computing user's demands are fulfilled over devices through internet by getting different services and resources like servers, memory and applications.

Cloud computing is itself a fuzz word that is contrasting to different people. For someone it is a different way of explaining information technology "outsourcing"; other people use this cloud computing word to describe the computing services that provide explored services on internet or on same kind of network; and some explained it as a computer delivered service which stays outside the scope of firewall. There are some examples which are defined below.

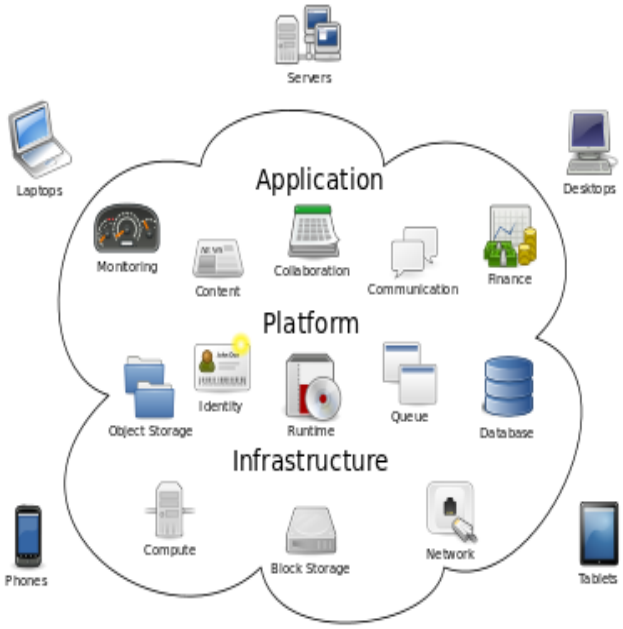

Fig2.1 Cloud computing model

Things that make cloud computing different.

It is managed

First and foremost, the services that are given by the cloud are provided by someone else. The information and services are managed by somebody else on user's behalf. For example if someone is working on Google documents that he or she doesn't have to care about purchasing the licenses for other software like MS Office. Their updating is also managed by the cloud itself. One doesn't have to worry about the viruses or the backups of the files. It is all done by the Google itself. The main principle of cloud computing is that one just have to concentrate on the accomplishment of the task and can stay carefree about services

that are to be purchased. Web services are present for this purpose only.

Its "on-demand"

The services on cloud are present as they are demanded and they are generally purchased on a "pay-as-you go". It is also called subscription. So purchasing cloud computing is just like buying internet services or mobile services from an adequate company. Moreover cloud computing is free of cost or paid in many ways. Just like water or electricity, one can purchase any amount of services or different type of services according to one's needs. One can buy these services on one's requirement from one day to another. That is one doesn't have to buy is own computer system, one can buy services as one need them.

Figure 2.2 Visual model of Cloud Computing Definition

2. Types of cloud computing

Cloud computing has three types of service models. There is an iota amount of ambiguity about the definition of these types. Also they overlap each other in between.

- **Infrastructure as a Service (IaaS)-** It is purchasing of raw hardware needed for computing over the internet for example memory and servers. Since one purchases the resources as he needs them therefore it is also called utility computing. The general hosting of web is an e.g. of IaaS: one pays monthly fee or fee depending on each megabyte or gigabyte so as to gain a host company serving data for one's site from respective servers.
- **Software as a Service (SaaS) –** It means we utilize the entire running of application on some other computer. The best examples of SaaS are online email and Google Documents. The example of well Saas provider that provides variety of online office application is Zoho. SaaS carries infrastructure as well as software.
- **Platform as a Service (PaaS)** - It refers to the development of application by making use of web based tools that runs on systems and hardware and software that are provided by different company. Like, developing your own ecommerce website on one's system but have the mechanisms like, checkouts, shopping carts and cost mechanisms running on a admin's server. Examples of PaaS are Google App engine andForce.com.

3. Advantages

The advantages of cloud computing are quite obvious and fascinating. In any kind of business whether it is of selling books, repairing shoes or in any kind of insurance office, it is not necessary to waste time and wages on different kind of activities like running anti-virus software on the system, updating word-processor, or focusing on system or hard drive crashes? Do is it important for us in cluttering our costly system with their private emails, illegally shared MP3 or MP4 files, and unwanted YouTube video when we have the choice to put these useless responsibility on someone else? Cloud computing environment allows us to pay only on that facilities and services that are required by us. When we want these services we cut the upfront capital cost of system and the connecting devices. We ignore the equipments and services that are going obsolete and other similar information technology like ensuring system security and reliability. We are allowed to add extra services or avoid them at any time whenever the business needs alteration. It is really rapid and convenient task to sum up latest applications and services to our business without waiting for long for new system and its hardware to come in the market

4. Literature Survey

. **[1]Taoshen Li and Xixiang Zhang** focused on a scheduling algorithm that adapts according to dynamic changes of the task given by user. This algorithm helps to delete the task dynamically that is at any point of time in the computing. Firstly the algorithm makes use of the directed acyclic graph also called DAG to explore the associative bonding among the functioning of jobs. Whenever there is a need to remove or delete a task, this algorithm governs a cost function to decide about the cancellation of task and then updates DAG on the basis of its dependence on the deleted task. Then at the end it uses a heuristic algorithm for the scheduling purpose. The results through experiments show that the algorithm can refrain from execution of scheduling of officially cancelled tasks thus improving the performance of computing resources. Its

efficiency is much better than other algorithms on the basis of execution time. **[2]Mahesh S. Shinde, Anil Kumar Kadam** described that cloud computing is one of the latest technology which deals with on-demand online sell and purchase of computing resources and services within managed environment on pay as u go scenario. Cloud Service Provider (CSP) manages all the requests of cloud users and allocates the resources (processors) to them. Cloud service provider thus plays crucial role of scheduling the available resources to the user tasks in order to reduce overall cost (cost that end user required to pay to cloud) in user specified time. In the proposed system, cloud resources are scheduled by using linear programming as an optimization technique along with Fuzzy C-Means (FCM). FCM is used as for making the clusters. Cloud user submits the batch of tasks (images for processing) through smart phone to a cloud service provider. Cloud service provider schedules these tasks among the number of resources (smart phones and processors) using FCM and linear programming. The proposed system schedules these tasks in such a way that it requires minimum cost under the time constraint given by submitter. The results of proposed scheduling strategy are compared with the results obtained by First Come First Served (FCFS) scheduling. **[3]Yu Zhang** use the concept of jamming time window, jamming satisfaction, efficiency ratio, establish a multi level target fuzzy cloud computing jamming system scheduling model by using time based window, through simulation. The output of this algorithm show the refined model that allocates the resources in cloud environment, there is a nominal difference within the predicted model time and the actual model time. This algorithm effectively decrease the possibility of lying into local convergence, the best solution is obtained with the limited objective function value that meets the user need more. **[4]Yu Zhang explained** the combination of jamming time window, jamming equation, jamming satisfaction, efficiency ratio. The results showed the improved algorithm that can accept the large number of tasks and allocate these tasks to the virtual machine, the efficiency and performance of this model is better than the previous research as it make the use of intelligence firefly algorithm. **[5]Qian Zhang, Hong Liang, and Yongshan Xing,** makes use of concurrent parallel task scheduling and it is the main problems that are faced in cloud environment. This field requires huge research work to handle large amount of data in the cloud computing model. Massive oil seismic exploration data processing requires high performance computing. The cloud environment is used to manage the task and resource allocation. Seismic data is the natural aspect so it needs maximum accuracy and it should increase the use of resources to be computed to assign the jobs to the specific resource in the cloud. This paper focus on the scheduling algorithm that gives optimized solution by using Bayesian algorithm. Fuzzy clustering is used to form fuzzy cluster of tasks and the resources. It makes use of the hybrid clustering of task and the machines that is based on fuzzy rules. After fuzzy clustering, the matching of task to the resources is done according to the matching degree. Dynamic scheduling is done for increasing the efficiency in limited cost. After that Bayesian classification algorithm is used to compare jobs and resources according to load. At the end, when this algorithm is verified with other algorithm, a system with higher efficiency is obtained. **[6]Zhijia Chen, Yuanchang Zhu, Yanqiang Di, and Shaochong Feng, explained that** the resources in cloud computing have features like high-scale, diversity, and heterogeneity. Moreover, the user requirements for cloud computing resources are commonly characterized by uncertainty and imprecision. Hereby, to enhance cloud computing service quality, not specifically satisfy the bandwidth and cost standards, but also particular stress should be laid on some extended standards such as system friendliness. The paper explores the concept of dynamic resource scheduling that focus on fuzzy control theory. Firstly, the resource requirements prediction model is established. Then the relationships between resource availability and the resource requirements are concluded. Afterwards fuzzy control theory is adopted to realize a friendly match between user needs and resources availability. Results show that this approach improves the resources scheduling efficiency and the quality of service (QoS) of cloud computing. **[7]Zhaobin Liu, Wenyu Qu, Weijiang Liu, explained that** cloud computing is the latest technology in the field of commerce. Cloud computing shows its presence in every field and has became the vital part in IT industries. To get the benefit of cloud computing, it should be used effectively and efficiently by making use of certain algorithm that are very important. However, using the correct scheduling in it is a huge task. At the time tasks scheduling in cloud network, it should fully use the resources by selecting the most appropriate resource. At the same time, there must be proper switching between the task and the resources. In cloud computing, communication gap is also considered and sometimes it can lead to a problem and can decrease the efficiency. Communication delay may lead to waiting between tasks and the processing unit. Fuzzy clustering algorithm is used to for the pre-processing of the resources. Acyclic graph which is constructed by using earliest finish time replication algorithm combine list scheduling with the task replication scheduling scheme. It makes use of cloud systems that are heterogeneous. Earliest finish time replication reduces the waiting time on the processor by inserting suitable immediate parent node. This algorithm works efficiently and shows that it is better than other algorithm described above as it makes use of heterogeneous cloud. **[8]V. Venkatesa Kumar and K. Dinesh,** explained that cloud computing environment provides computing as a service instead of product as a service. It provides the facilities like shared resources, information of the software, etc...Cloud computing is highly utilise for the task assignment to the present system resources such as storage, hardware and software. Some scheduling algorithms are mainly for the assignment of user tasks. When task scheduling is done on the basis of fuzzy scheduling, the tasks are firstly examined and on the basis of its QoS like bandwidth CPU utilization and size they are pied. The classified jobs undergo fuzzification where inputs are taken between the range of 0 and1. Then defuzzification is done to obtain the result. This algorithm was implemented in the

CloudSim. **[9]Amin Mehranzadeh, Seyyed** explained that the cloud computing is a new technology and Due to its economical and operational benefits it is the most popular concept in IT today. Clouds consist of group of virtual machines that can be provided on demand, depending on the user's needs. In the technology used by Amin Mehranzadeh, all the system utilities like hardware, software and operation system all the considered as service. In cloud environment one Host is a component that represents a physical computing and the datacenters are composed of set of hosts, whose task is to manage all the virtual machines. An important issue in cloud environment is to schedule the virtual machines requests, so that the task that has send the request can be allocated to the resource in minimum amount of time and can complete within the deadline. This paper works on the scheduling algorithm that is highly efficient within the datacenters for scheduling the VMs. This algorithm is compared to the First Fit (FCFS) and Round Robin (RR) and it shows the difference in the efficiency and the performance which is best suited in the cloud environment. **[10]Anita Prakash Patil, Dr. Haresh Chaudhary** explained in their work proposed the mathematical structure of task allocation to the resources by making use of fuzzy logic.When we use infrastructure as a service (IaaS) in the cloud model, the fuzzy logic is used in the scheduler. The conditions where dynamic load is available, Cloud lease scheduler for expected number of times. The resources in the datacenter are available in the flattered way, so a formulated way should be made to satisfy the pending request obtained from the user. The administrator has the right to take certain decision regarding resources that are available. The decision includes the data processing on remaining memory, availability of CPU cycle. Virtualized resources and software or platform as a service models of the cloud are created by using the logical resources. There are different functions of membership that are used to compute different problems of resources allocation to the task. **[11]Mrs Rekha A Kulkarni, Prof. Dr. Suhas H Patil,** explained that distributed computing is provided by the cloud computing environment which contains the hub of virtual dynamic scalable heterogeneous computing on the storage platform. On demand of the external user these computing power and memory are provided as Services. The main aim of cloud computing is to utilize all the resources by sharing the software and resources and make these things available to the client on demand. Resource scheduling main technology which plays a vital role in Cloud datacenter. For real time processing in cloud environment requires timing constraints to be satisfied of real time systems. Deadline misses are undesirable in time dependent application. One of the tedious job in Cloud datacenter is to schedule the resources by consider allocation and transfer of virtual machines (VMs). Next work is to meet the deadline. If the deadline of several tasks is missed then this may destroy whole functioning of the system. A by real-time scheduler should meet the deadline without regarding of any system delays or loads that are due to the various obstacles in the cloud area. This problem can be solved by opting a scheduling algorithm that schedules the tasks at the run time. In this paper such algorithm is used dynamically by using fuzzy set theory. **[12]Senthil Kumar, S.K. and P. Balasubramanie,** explained about the dynamic nature of system whereas the present scheduling algorithms are static in nature and consider number of factors like span, speed, time, cost, utilization etc. The scheduling algorithm that is available is heuristic and complicated. It consumed maximum time and do not support on availability and reliability of the cloud computing environment. Thus a scheduling algorithm is used that works on reliability in cloud environment. The proposed make use of linear programming that is based on allocation of tasks to the resources by focusing on decentralized cloud computing that is dynamic. The major focus is to maximize the reliability and availability of resources in cloud computing environment to get maximum gain for the cloud consumer by lowering the cost factor. It improves the execution cost by minimising it and decreases the total waiting time, total execution time and total turn around. This algorithm make use of traditional values of tasks like failure rate, success rate of tasks in all the cluster and this data is used for the future work .TP Scheduling that is Transportation Problem responded to number of tasks by clients in poisson arrival pattern and hence the reliability increases. **[13]Anita Prakash Patil, Haresh Chaudhari,** addresses the results of lease scheduling in the Infrastructure as a Service (IaaS) Cloud in uncertain conditions and makes use of Fuzzy Logic. The use of Fuzzy Control Logic (FCL) for the scheduling policies defined by the IEC standard is converted and final defuzzifed values have been used for lease scheduling in IaaS Cloud. The JFuzzyLogic library, have been used for solving this problem in the focus. **[14]Suresh Kumar V.S, Chandra Sekar. A,** explained that considering the clusters for computing Many Task Computing(MTC) problems is the challenging task when there are loosely coupled tasks. It is very difficult to form physical clusters as it has number of drawbacks.

1) Installation of hardware, software and investment in qualified personal consumes maximum capital

2) Some clusters remain unused for long time.

3) There is a problem of cluster overloading

4) During peak demand periods there are insufficient computational resources.

In this paper, the author explores the concept to deploy a computing cluster. **[15]Sunny Dahiya, Preety, explained that** cloud environment provides the distributed services available to multiple clients. These client access services are required to share in a resource effective way. In this work, an improved genetic based scheduling model is presented for cloud system scheduling. The presented work will be divided in two main stages. In first stage, the ordering of virtual machines will be done

5. Conclusion

We plan on having a broad scope of general process scheduling rather than focusing on a particular system environment, hence we are not too concerned with certain criteria such as response time or predictability. Fuzzy scheduling provides high scope of

scheduling the tasks in cloud environment. Its main purpose is to improve efficiency of processing data by using computing completely and effectively, submitting tasks in a transparent way, easily and efficiently.

The main aim of this type of computing in cloud environment is to apply conventional supercomputing techniques or very high efficiency computer power, generally used by research teams and military, to perform millions and billions of calculations per second, in user defined applications like financial portfolios to provide customized information, to deliver data storage for computer games.

References

[1]. Taoshen Li and Xixiang Zhang, "On the Scheduling Algorithm for Adapting to Dynamic Changes of User Task in Cloud Computing Environment", International Journal of Grid Distribution Computing Vol.7, no.3 (2014), pp.31-40,

[2]. Mahesh S. Shinde, Anilkumar Kadam, "Cloud Based Task Scheduling Using Fuzzy CMeans and Linear Programming Approach", International Journal of Science and Research (IJSR) ISSN (Online): 2319-7064 Index Copernicus Value (2013): 6.14 | Impact Factor (2013): 4.438,

[3]. Yu Zhang, "Multi-target and Fuzzy Cloud computing Resource Scheduling", Advanced Science and Technology Letters Vol.111 (NGCIT 2015), pp.94-98,

[4]. Yu Zhang, "Multi-target and Fuzzy Cloud computing Resource Scheduling Based on Intelligence Firefly Algorithm", International Journal of Grid Distribution Computing Vol. 8, No.5, (2015), pp.315-326,

[5]. Qian Zhang, Hong Liang, and Yongshan Xing, "A Parallel Task scheduling Algorithm Based on Fuzzy Clustering in Cloud Computing Environment", International Journal of Machine Learning and Computing, Vol. 4, No. 5, October 2014,

[6]. Zhijia Chen, Yuanchang Zhu, Yanqiang Di, and Shaochong Feng, "A Dynamic Resource Scheduling Method Based on Fuzzy Control Theory in Cloud Environment", Hindawi Publishing Corporation Journal of Control Science and Engineering Volume 2015, Article ID 383209, 10 pages,

[7]. Zhaobin Liu, Wenyu Qu, Weijiang Liu, Zhiyang Li and Yujie Xu, "Resource preprocessing and optimal task scheduling in cloud computing environments", Concurrency And Computation: Practice And Experience Concurrency Computat.: Pract. Exper. (2014), Published Online In Wiley Online Library DOI: 10.1002/cpe.3204,

[8]. V. Venkatesa Kumar and K. Dinesh, "Job Scheduling Using Fuzzy Neural Network Algorithm in Cloud Environment", Bonfring International Journal of Man Machine Interface, Vol. 2, No. 1, March 2012,

[9]. Amin Mehranzadeh, Seyyed Mohsen Hashemi, "A Novel-Scheduling Algorithm for Cloud Computing based on Fuzzy Logic, International Journal of Applied Information Systems (IJAIS) – ISSN : 2249-0868 Foundation of Computer Science FCS, New York, USA Volume 5– No.7, May 2013 – www.ijais.org,

[10]. Anita Prakash Patil, Dr. Haresh Chaudhari, "Fuzzy Mathematical Model for Resource Allocation in Cloud Computing Environment", International Journal of Advanced Research in Computer Science and Software Engineering, Volume 4, Issue 11, November 2014 ISSN: 2277 128X,

[11]. Mrs Rekha A Kulkarni, Prof. Dr. Suhas H Patil, "A Survey on Improving Performance of Real Time Scheduling for Cloud Systems", International Journal for Innovative Research in Science & Technology| Volume 1 | Issue 7 | December 2014, ISSN (online): 2349-6010,

[12]. Senthil Kumar, S.K. and P. Balasubramanie, "Dynamic Scheduling for Cloud Reliability using Transportation Problem", Journal of Computer Science 8 (10): 1615-1626, 2012 ISSN 1549-3636,

[13]. Anita Prakash Patil, Haresh Chaudhari, "Modeling Fuzzy Scheduling in Infrastructure as a Service Cloud", International Journal of Computer Applications (0975 – 8887), Volume 98– No.13, July 2014,

[14]. Suresh Kumar V.S , Chandra Sekar. A, "Fuzzy-GA Optimized Multi-Cloud Multi-Task Scheduler For Cloud Storage And Service Applications, International Journal of Scientific & Engineering Research Volume 4, Issue3, March-2013, ISSN 2229-5518,

[15]. Sunny Dahiya, Preety, "Scheduling of Independent Tasks in Cloud Computing Using Modified Genetic Algorithm (FUZZY LOGIC)", International Journal of Computer Science and Mobile Computing, IJCSMC, Vol. 4, Issue. 9, September 2015, pg.199 – 207, ISSN 2320–088X,

