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A Combined Strategy For Performance Enhancement In Cloud Computing

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***Abstract*—** Cloud computing has become an important phenomena in computing and internet era. Cloud computing has enabled service providers to completely present their services in cloud platform. The main challenge is to fully utilize those resources in such a way so that system performance has increased and energy utilization has decreased. In this paper, we presented a combined strategy that allows more than two users to schedule the task. Experimentation shows that our proposed strategy increases the success rate by significantly decreasing the energy consumption and increases the cloud processor performance. The purposed criteria are shown by comparing it with traditional algorithm.

***Keywords*—** Cloud Computing, Job Scheduling in Cloud for performance improvement, combined strategy

I. INTRODUCTION

Several computing rules are combined to deliver this utility computing vision and these involve cluster computing, Grid computing, and Cloud computing. The last term implies structure as a cloud from which users and business class can access any data from any place. As this technical world is rapidly transforming towards software development for million people to consume as a service rather than to run their individual computers .Clouds are generated so that users can access data from anywhere and can access applications at competitive cost.

Cloud Deployment Models

The four common deployment models are represented as [3]:

- Public cloud

The cloud architecture is taken by the cloud service provider. The complete cloud architecture exist in the section of cloud provider. General people or a large industry group can share the services for usage on pay according to usage method. Resources are alloted on demand to the user. These are allocated on dynamic basis throughout the Internet. Small and medium enterprises (SMEs) are benefitted by using public cloud.

- Private cloud

Architecture in this cloud is operated separately for an organization. It can be controlled itself by the organization or by third party.

- Hybrid cloud

The architecture in this cloud is a mixture of more than two clouds (private, community, or public). They are linked or remain as a special entity. This technique enables data and application portability

- Community cloud

The structure in a community cloud is contributed by variety of organizations which have shared concerns (e.g., mission, security requirements, policy, and compliance considerations). It is generally controlled by the organizations or a third party in the community and can be present on either on- or off-premises [3].

II. JOB SCHEDULING

There are various types of scheduling algorithm present in distributed computing system. Most of them can be applied in the environment of cloud with suitable verifications. The main pro of scheduling process is to attain high processor utilization and the best throughput of the system. Previous processes are unable to provide scheduling in the cloud computing environments [4]. The job scheduling process manages the arrangement in which each task will run and

also controls the allotment of resources [5]. In parallel systems it is difficult to schedule a list of task which is an important and complex issue. Solving this problem could improve the result and interaction among nodes in parallel and distributed systems .To improvise the system performance and system throughput task scheduling is done by assigning correct task to correct processor thus increasing resource utilization, decreasing execution time, decreasing cost on the side of the user and fulfilling economic conditions [7]. Scheduling processes can be classified into 3 stages namely [4]–

1. Resource discovering and filtering – Datacenter Broker collects all the status information and examined the resources present in network system.
2. Resource selection. Target source is selected on certain basis .This is deciding stage.
3. Job submission -Task is submitted to resource selected.

The purpose of scheduling is to spread the effect on processors and enhance their utilization by minimizing the time taken by the task to execute. The main work of scheduling is to schedule jobs onto the adaptable resources in time, which requires finding out a proper arrangement in which under logic constraints jobs can be executed. The main pros of scheduling are to attain high computing performance and system throughput [6]. A job scheduler can recruit and manage jobs, mechanically by processing organized job control semantic accounts or through corresponding communication with a human operator. In circulated network of users job schedulers classically provide interaction to the client and single point of control. Job scheduling is serious if the full computational power of large scale multicomputer is to be attached effectively. The aim of scheduling the job is to select the corresponding task to be implemented while the area of processor distribution is to choose the set of processors on which execution of parallel jobs are being done. The major advantages of scheduling are the classification scheduled processes that are dependent on multiple systems [8].

III. LITERATURE SURVEY

Yintian Wang et.al,2014[1] In this, author discussed about Round Robin with multiple feedback Job scheduler in Hadoop. The design is made to reduce average response time and improve job through put.

Xiuhua li et.al,2014 [2] In this, author described job scheduling for cloud computing integrated with wireless sensor network. He analysed the characteristics of CC-WSN integration

Alaka Ananth et.al, 2014 [3] In this author designed therotic processes for job scheduling in cloud computing.

Abhishek Gupta et.al, 2015[5]In this, author intended to present the performance and comparison of various previous job scheduling processes considering various paradigms. In this paper scheduling task and cloud concepts are being discussed and were compared in tabulated form with respect to various parameters.

Dazhao Cheng et.al, 2015[4] In this paper, author discussed scheduling process that selects the job with the least execution time. The process with less execution time placed on top and the job with the longest execution time placed last and given the lowest priority. This algorithm deals with different approaches. In this algorithm, CPU is allocated to the process with least burst time.

IV. EXISTING ISSUES IN JOB SCHEDULING

Based on needs and type of system client has, system designer must consider various factors in designing algorithm to schedule jobs. Depending on the system, the user and designer must expect the scheduler to increase throughput, decrease overhead, Reduces the energy consumed by the jobs and increase the network performance. A good scheduling algorithm must have following characteristics Minimum context switches, Maximum processor utilization [9]. In traditional approaches like priority algorithm, high priority tasks always top priority to run because of this less priority task have to wait for a long time. Sometimes low priority task gets a chance to run but, if high priority tasks keep coming then lesser priority task is claimed and resources get allotted to task with high priority due to which there comes increase in execution energy of a task and reduces performance of system. A cloud provider discovers methods to increase their margins by executing larger number of jobs by reducing the operational costs. Energy consumed by servers plays an important role in operational costs that should be addressed. By design, most data centres, consume massive amounts of energy in an appropriate wasteful manner which should be reduced.

V. PROPOSED HYBRID JOB SCHEDULING ALGORITHM

Processing and scheduling jobs in cloud system is NP-complete. There are various methods by which can find the solution of scheduling problems in less than the polynomial time. Hybrid based scheduling methods are one of them but it has seen that they give better output as compared to traditional algorithm. In cloud network all the machines are heterogeneous; thereby a job may take different execution time on each processor. Proposed hybrid strategy focussed on two different modules to run the user tasks on the resources present in cloud network. The first module in this approach aims to provide management function of the queues by multi queue scheduling approach and other input the tasks on the cloud server. It reduces the load on a cloud server and

starts arranging process with well planned structure based upon the jobs received execution pattern is decided by the user. Another module executes all the threads using P threading technique and allocates them to virtual machine for processing. The P threads standard defines a thread-scheduling mechanism that enables programs with real-time tasks to get involved in the process. The flowchart for our proposed hybrid strategy is shown below in figure 1:

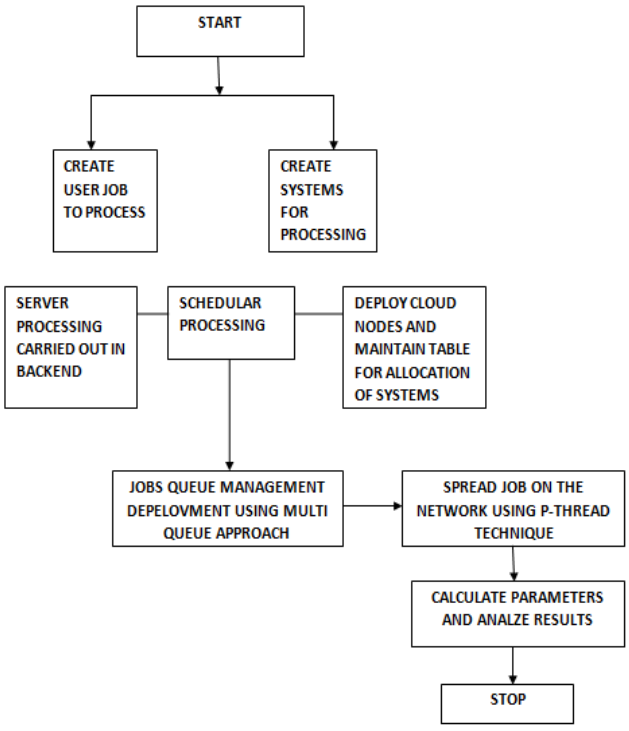

Figure1.flowchart of proposed hybrid strategy.

This approach is having various steps which are used to show a virtual environment for processing tasks and compute their execution parameters. The said hybrid approach group tasks depend on the processing capacity and select some best resources to schedule them so as to reduce energy. The various tasks and systems are created in tasks and system creation phase

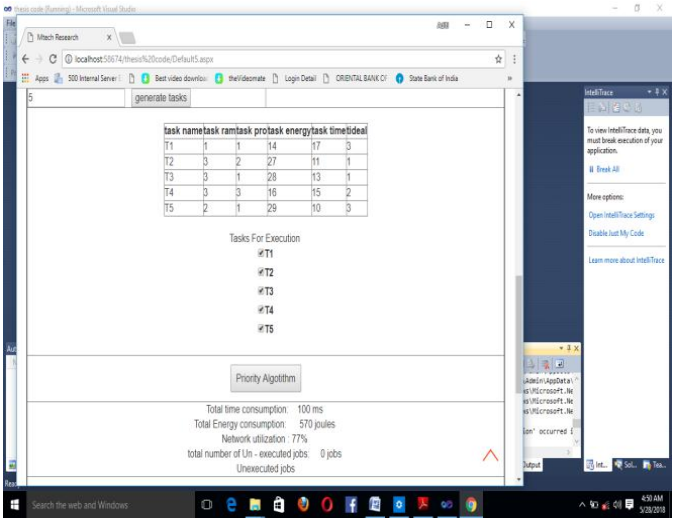

Figure. 2 Priority Algorithm

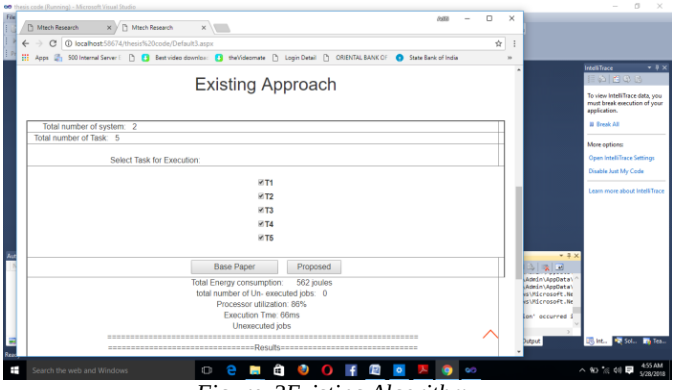

Figure. 3Existing Algorithm

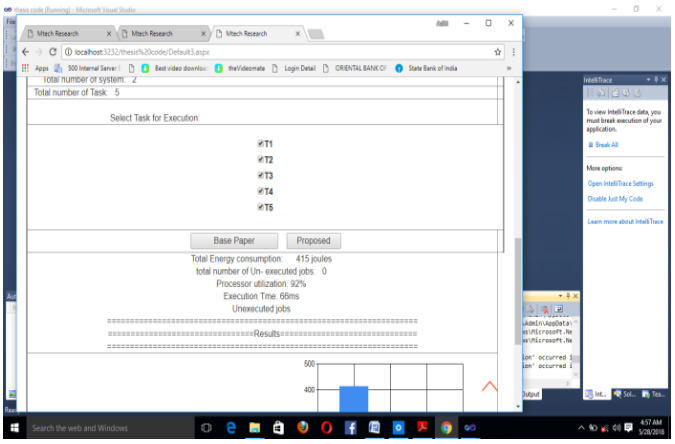

Figure.4 Proposed Algorithm

The energy and processor utilization is computed as:
Energy = energy consumed by total jobs you submit + waiting time of all jobs *ideal energy.
Processor utilization= execution time of all submitted jobs on resources - ideal time of resources

VI. RESULT AND DISCUSSION

To obtain and evaluate the results of the original strategy, the simulation was done using different simulation scenario, the current process is compared to the existing scheduling processes by generating the cloud network in Microsoft window azure using SQL and Microsoft visual studio2010 at frond end. We have implemented multiple systems and tasks with different task size. We implemented two scheduling processes priority scheduling algorithm, A Round Robin with Multiple Feedback [5] and our proposed hybrid approach on the parameters of energy consumption and Processor Utilization.

A. Energy Consumption of the Jobs

Energy Consumption parameter in cloud data centres is a current issue that should be considered with more care these days. It is the amount of energy used by a process or system. Many scheduling algorithms were developed for declining the amount of power consumed and improving performance. The current hybrid approach minimizes the energy consumed by the jobs compared with the other algorithms such as Priority Algorithm and Round Robin with Multiple Feedback [5] .The Fig 2 represented the energy consumed by jobs by showing comparison for three algorithms on no of user jobs 5 and 10.The comparative graph shows that our proposed approach tookover base paper (hybrid round robin) and priority algorithm. The energy consumed by the jobs is measured in joules and the result of best iteration is shown below:

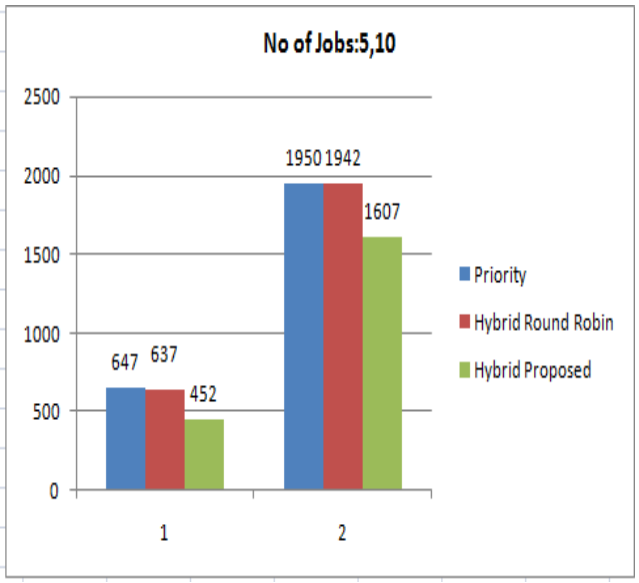

Figure5: Comparing the Energy Consumption of three Algorithms.

B. Processor Utilization

Processor utilization parameter is used to compute the effectiveness of the scheduler that how efficiently scheduler used their network systems. Greater utilization shows better performance of scheduling algorithm. Our current algorithm took over the other existing algorithm when compared. The Fig 3 shows the processor utilization of the resources on number of user jobs 5 and 10 in cloud network. During the execution of the jobs, the job cannot fully utilize the complete processing speed of the resources but good scheduling algorithm utilizes the idle computing power of the resources. In the proposed algorithm, the processing speed of the resources is effectively utilized by simultaneously running the jobs. Our current strategy took over the existing algorithms when compared. The output of best iteration is shown below.

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Dr.karambir bidhan currently working as Assistant professor in Department of Computer science,University institute of Engineering and Technology,Kurukshetra University, Kurukshetra and has teaching experience of more than 15 years.He has published 15 international and 1national research papers in reputed journals and conferences.

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