



CLOUD COMPUTING BASED JOB SCHEDULING ALGORITHM FOR CONDITION

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Abstract: Cloud computing is a type of internet based computing that provides shared computer processing resources and data to computers and other devices on demand [pay per-use model] which is changing the world around us. The reason to go for cloud computing is that it gives cost effective, flexible, mobility, secure, scalable, etc. However, the growing demand of cloud infrastructure has considerably increased the energy consumption of data centers, that has become a critical issue and thereby it increased the emission of carbon dioxide (CO₂) which is not environmentally friendly. To overcome this issue the technique called Green cloud computing appears that can not only save energy, but also reduce operational cost consumption is reduced in data centers by scheduling the job using priority algorithm at the rate of Power Usage Effectiveness [PUE] called PP Scheduling Algorithm. Power usage efficiency (PUE) is a metric used to determine the energy efficiency of a data center. Before the job is allocated to the data center, PUE rate for each data center is calculated and the data center with the efficient or average PUE rate is chosen for the job allocation in order to reduce the power consumption.

Keywords: cloud computing, job scheduling, energy consumption, energy saving, data centre.

1. INTRODUCTION

Clients can store, access and offer any measure of data in cloud. The distributed computing pattern sounds undefined; however it's not all that fluffy when you see the offer from the viewpoint of IT experts. This innovation can accomplish correspondence, stockpiling, preparing, superior, facilitating and benefits on interest to cloud client. The developing of social applications and e-business need to build the quantity of server farms. As per IDC (Universal Information Enterprise) report, the worldwide IT cloud administrations spending is evaluated to increment from \$16 billion out of 2008 to \$42 billion of every 2012, speaking to a compound yearly development rate (CAGR) of 27% [1]. Today, a common datacenter with 1000 racks require 10 Megawatt of capacity to work, which result in higher operational expense. Along these lines, for a datacenter, the vitality cost is a huge part of its working and in advance expenses. As indicated by a report distributed by the European Association, a declines in discharge volume of 15%-30% is required before year 2020 to keep the worldwide temperature increment underneath 2 degree Celsius

2. DATA CENTER

The server farm is a substantial gathering of arranged PC server regularly utilized by association for the remote stockpiling, handling, recovering or dissemination of vast measure of information. These distributed storage supplier are in charge of keeping the information accessible, available, physical natural secured and running. Vitality utilize is a focal issue for server farm. Power draw for a server farm extend from kW for a rack of server when the outside temperature is beneath 12 or 13 degree C, outside air can be utilized to successfully cool warmth consumed by the cooling framework. Where on account of over 26 degree C it is hard to cool with the goal that we utilize power utilization viability (PUE) figuring for every datum focus.

Ordinarily server farm with 1 to 1.9 is productive, 2 to 2.5 is normal or more 2.5



Figure 1 Data Center

A. Types of Data

The measure of electronic data (precedent: record, pictures, messages and recordings) association produces is a stunning. Putting away all the computerized information in our server farm be costly. That is the reason cloud server farm which regularly comes at a small amount of expense of putting away the data on-premises has turned out to be progressively prevalent

SCHEDULING IN CLOUD

A basic necessity in distributed computing condition is planning the current occupations to be executed with the

given imperatives. Distributed computing is likewise about how IT is provisioned and utilized and not just about mechanical changes and furthermore the booking of server farms. The primary focus of planning is to amplify the asset use and limit preparing time of the errands. The scheduler should arrange the employments in a way where balance between enhancing the nature of administrations and in the meantime keeping up the effectiveness and decency among the occupations. An effective activity planning procedure must expect to yield less reaction time. so the execution of submitted occupations happens inside a stipulated time and at the same time there will be an event of in time asset reallocation. Thus, employments happens and more number of occupations can be submitted to the cloud by the customers which at last outcomes in quickening the business execution of the cloud framework [5].

RELATED TO WORK MODEL

The related model proposes another cross breed calculation for decrease of vitality utilization and makes range by consolidating subterranean insect state streamlining calculation (ACO) and cuckoo seek calculation. The detriment of subterranean insect state improvement has been overwhelmed by cuckoo look. The vitality devoured is figured and the change rate is contrasted with ACO calculation with deference with number of errand.

B. Ant Colony Optimization

For taking care of computational issues insect province enhancement strategy can be utilized in view of the probabilistic nature, subterranean insect state improvement is utilized to find best way through charts, in light of action of ants searching for a way among their settlement looking for nourishment source. This thought has been utilized to tackle different numerical issues; numerous issues have turned out dependent on different particular highlights of insect practices.

C. Cuckoo Search

Cuckoo scan is utilized for the enhancement issue, it has been seen that execution of the cuckoo look is higher than other Meta heuristic calculations. Portrayal of cuckoo seeks (CS): every last egg in the home means an answer; another arrangement is spoken to by a cuckoo egg. The fundamental inspiration of cuckoo egg is to determine the best arrangement and to supplant the arrangement, or, in other words great in the homes. Each home contains precisely one egg.

D. Working

Working of this algorithm is done by the initialization of pheromone, heuristic information, number of nest and random initial solution has to be done. The jobs that have to be done by the colony of ants are determined. For processing of next job, transition rule have to be applied. Construction of ant scheduling for each and every ant is carried out, that is which ant has to execute first is scheduled. Finding resources for job scheduling in cloud

computing has been performed using the cuckoo search process; since cuckoo search is very easy to implement that is local search in ant colony optimization is performed using cuckoo search. Trail of pheromone is updated using a new solution and global updation is also carried out. Once local search and other non-local are performed process is terminated. [6]

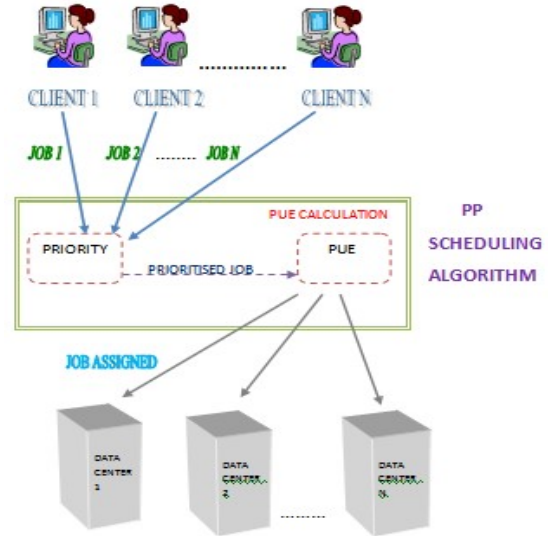


Figure 2 Architecture of Scheduling

3. JOB SCHEDULING ALGORITHM

This model goes for examine and explore need work planning calculations under cloud condition to give quality support of the undertakings and certification reasonableness among the occupations served. A few calculations and conventions are proposed in regards to the planning system of the distributed computing.

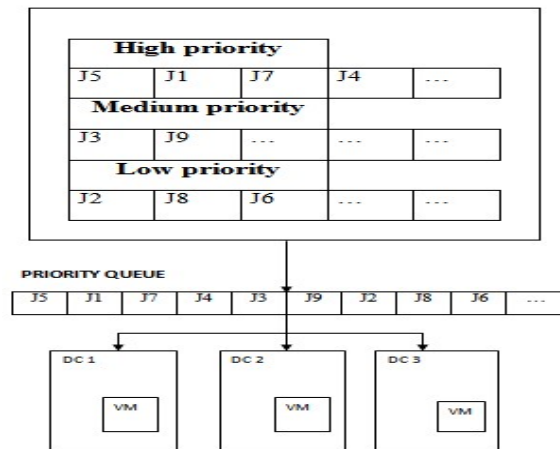


Figure 3 Job Scheduling Algorithm

It is difficult to convey the recreated work straightforwardly to this present reality since cloud administrations are layered administrations and it thinks about extra situations moreover. For instance when we are giving an administration as cloud, we have a few undertakings that have higher needs and should have been complete first and there will be some different errands

which are characterized before and should have been performed by the planned time. These are the situations that varies the reenacted work with this present reality. To delineate reproduction in certifiable all the more adequately first partition employments into high, medium and low needs. In light of these needs the occupations are planned for the need line [7].

Be that as it may, not very many calculations are proposed to distinguish the planning component in distributed computing. A large portion of the creators consider a consistent checking district in their convention, or, in other words genuine situation. Essentially the checking area is constantly unpredictable as the mists are arbitrarily sent. So we propose a calculation to plan the employments in distributed computing. The majority of the creators consider the FCFS booking for preparing the occupations. In this condition it diminishes the assets usage and use of server. [8]

4. POWER USAGE EFFECTIVENESS (PUE)

Power usage efficiency (PUE) is a metric used to determine the energy efficiency of a data center. PUE is becoming a key tool used in selecting a data center. PUE is the ratio of total amount of energy used by a computer data center facility to the energy delivered to computing equipment. An ideal PUE is 1.0. Anything that is not considered a computing device in a data center (i.e. lighting, cooling, etc.) falls into the category of facility energy consumption [9].

$$PUE = \frac{\text{Total Facility Energy}}{\text{IT Equipment Energy}}$$

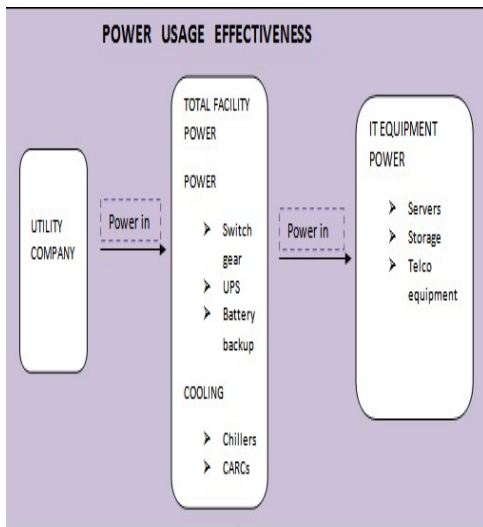


Figure 4 Power Usage Effectiveness

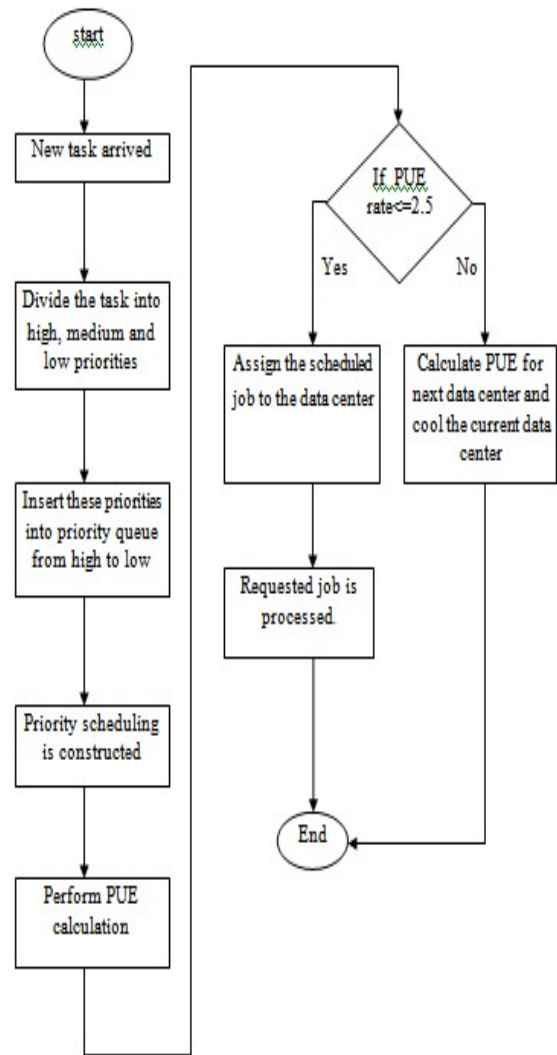


Figure 5 Flow Chart of Power Usage

5. COMPARISON OF ALGORITHM

Table 1

Algorithms	Complexity	Allocation	Waiting Time	Type of system
FCFS Algorithm	Simplest Scheduling Algorithm	CPU is allocated in the order in which the processes arrive	More	Suitable for Batch system.
SJF Algorithm	Difficult to understand and code	CPU is allocated to the process with least CPU burst time	Lesser than FCFS	Suitable for Batch system.
Priority Algorithm	Difficult to understand	Based on priority. So the higher priority job can run first.	Lesser	Suitable for both Batch and time sharing systems
Round Robin Algorithm	Performance heavily depends upon the size of time quantum	The preemption take place after a fixed interval of time	More than all	Suitable for time sharing system
Genetic Algorithm	Complexity depends on the task to be scheduled	This is a greedy algorithm and pick the best job to allocate the CPU	Waiting time is less	It deals with problem where the search space is large

6. ADVANTAGES OF CLOUD COMPUTING

1. Job scheduling is global centralized – As distributed computing is a figuring model which supply the concentrated asset by the mirror administration to different appropriated applications, and this reflecting arrangement can make heterogeneous systems.

2. Each node in the cloud is independent– In distributed computing, the interior booking of each cloud hub is self-governing, and the schedulers in the cloud won't meddle with the planning arrangement of these hubs.

3. The set of job scheduling- The scale of resources supply from cloud provider may be limited in early stages. The size of assets supply from cloud supplier might be restricted in beginning times.

4. The set of occupation booking - Errand planning is isolated into two sections: one is utilized as a bound together asset pool planning, and fundamentally in charge of the booking of utilizations and cloud Programming interface; the other is for the brought together port asset.

CONCLUSION

In existing model, subterranean insect settlement association plans the activity and cuckoo seek picks the best VM and in proposed demonstrate we plan the activity utilizing need planning and best server farm is picked by utilizing PUE rate. In this paper the issue of vitality utilization in server farm is explored. PP planning calculation was proposed and it is actualized in the engineering of PP booking. With the assistance of intensity utilization adequacy (PUE), the booked activity is doled out effectively to the server farm. By this the server farm with high PUE rate are compelled to stop and permitted to cool which decreases the power utilization in the server farm which thusly controls the outflow of co2. Alongside power utilization it plan the activity inside their due date, which results in load offsetting with time proficiency.

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