# A REVIEW ON ENERGY EFFICIENT SCHEDULING IN GREEN CLOUD COMPUTING

Manveer Singh [#1], Jasmeet Singh Gurm [#2]

[#]*CSE Dept, RIMT Mandi Gobindgarh*

[1]msmaan85@gmail.com

[2]jasmeetgurm@gmail.com

**Abstract: Green Cloud system is now in focus due to its energy consumption minimization system as the entire world is suffering from the global warming process. In the cloud server networks it becomes essential for a system to save energy in terms of processing of a request from one end to another. Disabling dead processes may be another optimistic approach in such a case .This paper focuses on different types of approaches which can be used in the minimization of the energy consumption of the cloud networks.**

**Keywords: Energy Consumption, Cloud Network, Process Scheduling.**

## I. INTRODUCTION

The issues in the cloud data centre is a major factor to be though about. Each and every thing kept on cloud should be kept in a safe and secure manner so that the unauthorized users can not access the contents of the users. There are some inbuilt architecture systems to prevent data from any theft from external attack but they are not secure enough. In addition to that the server does not have any extra scheduling approach which can minimize the energy consumption of the scheduled process. By default only one scheduling approach is in action i.e. FCFS. To minimize the energy consumption, it is required to design a hybrid algorithm which consumes least amount of energy.

*1) A Brief Description On Cloud Computing:* Cloud Platform is a new technology which tries to provide the entire scenario of the development and other services to the user. There are different slots or sections of a cloud services. They are as follows:
   a) IAAS
   b) PAAS
   c) SAAS
IAAS stands for infrastructure as a service where as PAAS stands for Platform as a service and SAAS stands for Software as a service. All of the three paradigms are

necessary for any cloud computing data centre. It is assumed that in future days the entire services will be provided by the cloud itself and the user will have to pay for each and every kind of service which the user uses .[1]



Figure 1: represents the utilities of cloud

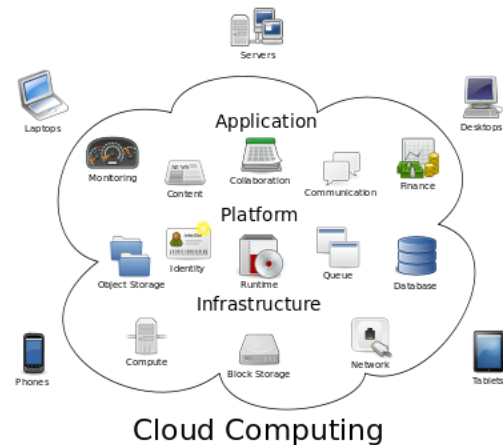## II. ARCHITECTURE OF CLOUD COMPUTING



Figure 2: represents the over view of Cloud Computing

As discussed above the cloud computing is divided into three sections namely IAAS, PAAS and Saas. Iaas stands for infrastructure as service and in this services, the cloud computing provides the entire infrastructure over which the work has to be done like if the user needs an operating system,

the operating system will be provided by the cloud server and it would be checked by the server itself that how much charge should be taken from the user. In the same manner the Paas provides the platform to the user like if some development platform is required like JAVA, .NET or PHP it would be on cloud and user can access the cloud with his or her user id and password. Saas provides software to the user required by him. The cloud will charge from the user for each and every thing provided by his end but it would be official products of the companies.

### III.    TYPES OF GREEN COMPUTING

1)  *Carbon free computing:* Carbon free computing refers to executing the process in such a manner that the system gets less heated up and it emits a least amount of CO2. As CO2 is one of the major reasons of the global warming, this becomes a major issue in terms of green cloud.

2)  *Solar Computing:* Solar systems a becoming quite popular these days as they gets energy from the sun and emits least amount of CO2 hence it is tried that the energy is stored by the sun and used by the devices getting used.

3)  *Lead-Free and RoHs computing*: RoHS is the short form for Restriction of Hazardous Substances. RoHS, also recognized as Directive 2002/95/EC.  It starts off in the European Union and restricts the, utilize of particular perilous materials that are found in electrical and electronic goods. Every one of relevant products in the EU advertises after July 1, 2006 should be RoHS acquiescent. The materials barred under RoHS are polybrominated diphenyl ethers (PBDE), mercury (Hg), cadmium (Cd), hexavalent chromium (CrVI), lead (Pb) and polybrominated biphenyls (PBB).
The constrained substances are dangerous to the surroundings and contaminate landfills, and are hazardous in provisions of work-related occurrence for the duration of built-up and reuse. RoHS is very important for security concerns of nation. X-ray fluorescence or else XRF metal analyzers, are being used for authentication of RoHS agreement.

4)  *Energy-efficient computing*: Energy efficient computing has a concern only with developers of computer and mobile communication systems, in which battery volume and revive intervals restricted their usefulness. In the ancient times , the significance of dropping energy has turn into a innermost concern for developers of computers as well because of the power restrictions of a average

household power channel and as they are often organized in huge groups, in the case of attendant farmhouses.  The dual approach is required to eradicate the energy problem: maximizes energy effectiveness and reduces energy use, expand new sources of unsoiled energy.

### IV.    JOB SCHEDULING

Job Scheduling is used to allocate certain jobs to particular resources in particular time. In cloud computing, job-scheduling problem is a biggest and challenging issue. Hence the job scheduler should be dynamic. Job scheduling in cloud computing is mainly focuses to improve the efficient utilization of resource that is bandwidth, memory and reduction in completion time. An efficient job scheduling strategy must aim to yield less response time so that the execution of submitted jobs takes place within a possible minimum time and there will be an occurrence of in-time where resources are reallocated. Because of this, less rejection of jobs takes place and more number of jobs can be submitted to the cloud by the clients which ultimately show increasing results in accelerating the business performance of the cloud. There are different types of scheduling based on different criteria, such as static vs. Dynamic, centralized vs. Distributed, offline vs. Online etc are defined below:

1)  *Static Scheduling*: Pre-Schedule jobs, all information are known about available resources and tasks and a task is assigned once to a resource, so it's easier to adapt based on scheduler's perspective [7].

2)  *Dynamic Scheduling*: Jobs are dynamically available for scheduling over time by the scheduler. It is more flexible than static scheduling, to be able of determining run time in advance. It is more critical to include load balance as a main factor to obtain stable, accurate and efficient scheduler algorithm.

3)  *Centralized Scheduling*: As mentioned in dynamic scheduling, it's a responsibility of centralized / distributed scheduler to make global decision. The main benefits of centralized scheduling are ease of implementation; efficiency and more control and monitoring on resources. On the other hand, such scheduler lacks scalability, fault tolerance and efficient performance. Because of this disadvantage it's not recommended for large-scale grids.

4)  *Distributed / Decentralized Scheduling*: This type of scheduling is more realistic for real cloud despite of its weak efficiency compared to centralize scheduling. There

is no central control entity, so local schedulers' requests to manage and maintain state of jobs' queue.

5) *Pre-Emptive Scheduling:* This type of scheduling allows each job to be interrupted during execution and a job can be migrated to another resource leaving its originally allocated resource, available for other jobs. If constraints such as priority are considered, this type of scheduling is more helpful.

6) *Non Pre-Emptive Scheduling*: It is a scheduling process, in which resources are not being allowed to be re-allocated until the running and scheduled job finished its execution.

7) *Co-operative scheduling*: In this type of scheduling, system have already many schedulers, each one is responsible for performing certain activity in scheduling process towards common system wide range based on the cooperation of procedures, given rules and current system users [6].

8) *Immediate / Online Mode*: In this type of scheduling, scheduler schedules any recently arriving job as soon as it arrives with no waiting for next time interval on available resources at that moment.

9) *Batch / Offline Mode*: The scheduler stores arriving jobs as group of problems to be solved over successive time intervals, so that it is better to map a job for suitable resources depending on its characteristics.

## V. CONCLUSION

The above paper concludes about different approaches of green cloud and the parameters of computation of the green cloud system. In this architecture, scheduling approach should be efficient to implement processes. This paper also discusses about different types of scheduling processes to be used in a cloud network system.

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