

Energy Consumption by various Job Scheduling Approaches

Manveer Singh ^{#1}, Jasmeet Singh Gurm ^{#2}

[#]CSE Dept, RIMT Mandi Gobindgarh

¹msmaan85@gmail.com

²jasmeetgurm@gmail.com

Abstract: Data centers are the core part of any cloud computing services. These are used to store huge amount of data, like Google, Amazon, Yahoo and eBay are operating such huge datacenters around the world. Today, a typical datacenter with 1000 racks need 10 Megawatt of power to operate, which results in higher operational cost. The main issue that exists in today's era is energy consumption. There is a strong need to manage energy consumption across IT sector. In the proposed work, energy consumption is reduced by the use of FCFS and Priority based algorithm on the basis of jobs executed. The results and experiments are evaluated in .NET environment.

Keywords: Job scheduling, FCFS, Priority, Energy consumption, cloud computing.

I. INTRODUCTION

Modern data centers are running variety of applications varying from applications run at few seconds to applications run at longer times. Running multiple applications needs to enhance the throughput, response time. Mostly applications required only enhancement of the throughput they set aside the main factors like power and energy consumption. As data centers are very expensive to handle such problem, So only cloud service providers can adopt the means that ensure to handle the problem of energy efficiency in the clouds.

Reducing the energy usage is very complex issue. As in this process servers and disks are needed to run fast without

requiring more time. So green cloud computing is only the way to achieve the high performance with less energy consumption. To address this problem, data center resources need to be managed in an energy-efficient manner to drive Green Cloud computing. In particular, Cloud resources need to be allocated not only to satisfy QoS requirements specified by users via Service Level Agreements (SLA), but also to reduce energy usage.

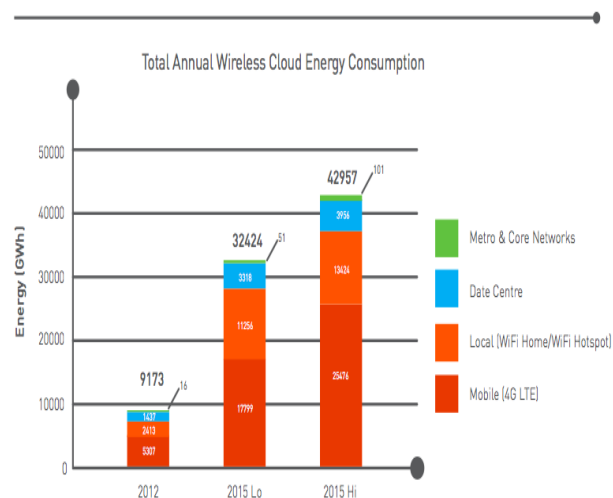


Figure 3 Estimate for annual energy consumption broken down into the various components of the wireless cloud ecosystem, 2012 and 2015 (Lo and Hi scenarios; see Table 1).

Figure1: Total energy consumption 9 [reneweconomy.com]

II. ADVANTAGES OF GREEN CLOUD COMPUTING

- a) Reduced operational cost
- b) Keeps environment clean due to use of hydroelectric generators.

III. REASONS WHY GREEN CLOUD COMPUTING IS NEEDED

- a) Energy and resource efficiencies.
- c) Maximizing and utilization of to drive efficiencies
- d) Pay per use and self service.
- e) delivering efficiencies of scale to benefit many organizations

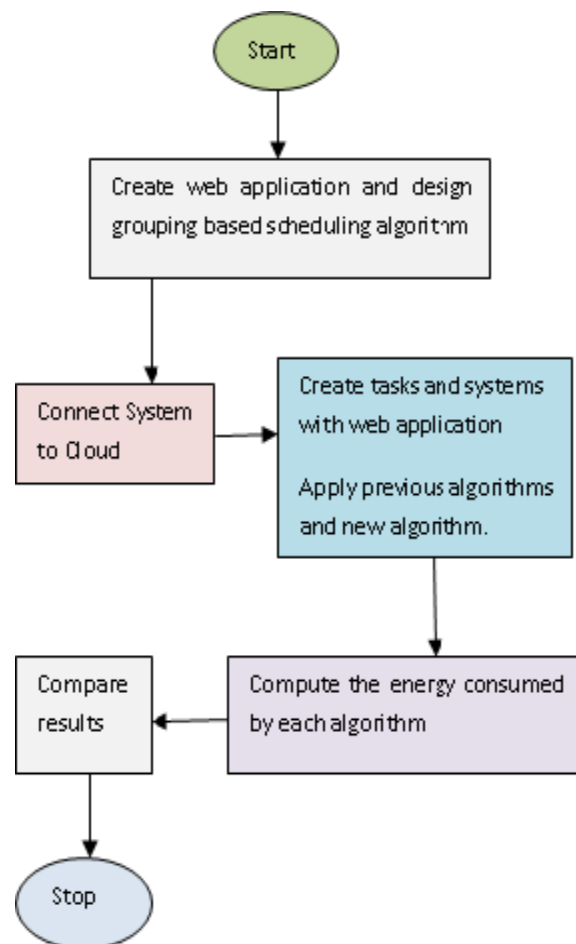
IV. FEATURES OF GREEN CLOUD COMPUTING

- a) *Multi-tenancy*: Using multi-tenancy approach, Cloud computing infrastructure reduces overall energy usage and associated carbon emissions. This is efficient approach as there is no need of installation multiple softwares.
- b) *Server Utilization*: Using concept of virtualization, large no. of applications can be run on same server. Thu utilization level enhanced to 70%. So this decreases the active servers. So in turn energy efficiency reduces.
- c) *Datacenter Efficiency*: Using energy efficiency technologies, PUE can be enhanced drastically. The server design in the form of modular containers, water or air based cooling, or advanced power management through power supply optimization, are all approaches that have significantly improved PUE in datacenters.

V. PROPOSED METHODOLOGY

Scheduling is one of the most important tasks in cloud computing environment. There are various existing scheduling algorithms that give high throughput and are cost effective but they do not consider energy utilization. So we need an algorithm that improves energy efficiency in cloud computing environment. Hence the research of this area would involve the creation of new algorithm for the energy

efficient scheduling and the comparison of the same with the earlier developed algorithms.



VI. RESULTS AND DISCUSSIONS

No. of Systems	Energy (FCFS)	Energy (Priority)
5	40	30
10	45	40
15	50	35
20	65	25

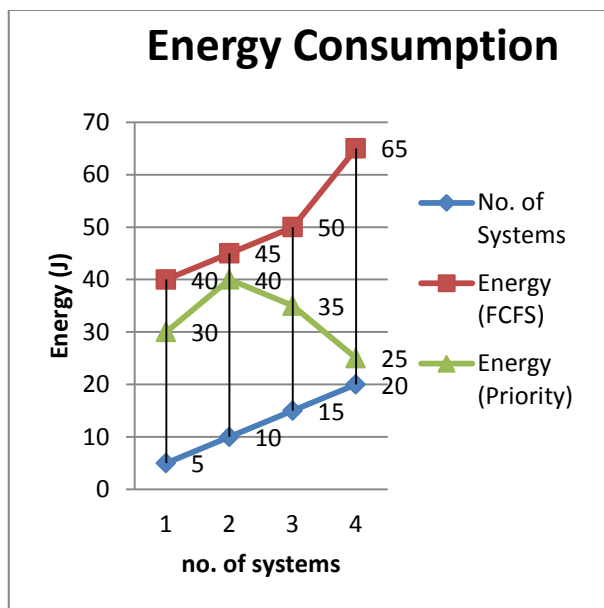


Figure.2 Energy Consumption

VII. CONCLUSION

Reducing the overall energy consumption is critical problem in the today's Information Technology. As the IC technology continues to scale down, reduction in energy consumption is becoming a more and more significant part. In this paper, we investigated the problem of applying scheduling techniques to reduce the overall energy consumption for various clouds. In the end it is also concluded that FCFS consumes more energy in accordance to Priority algorithm.

ACKNOWLEDGEMENT

I would like to express my gratitude to all the people who have given their heart welling support in making this completion a magnificent experience.

REFERENCES

- [1] M. Sheikhalishahi, M.Devare, L. Grandinetti (2011), "A General purpose And Multi-level Scheduling Approach in Energy Efficient Algorithm" , CLOSER Conference.
- [2] Susane Albers (2010),"Energy efficient algorithms", Communication of ACM, vol.53 No.5, 86-96.
- [3] D.Nurmi, R.Wolski, C.Grzgorczyk (2009), "The eculyptus open-source cloud-computing system", In Proc. Of CCGRID'09, 124-131.
- [4] M. Devare, M .sheikhalishahi, L.Grandinetti (2010) ," Prototype Implementation of Desktop cloud ", by IOS press, Netherland ,presented in Centraro International workshop on HPC, Grids and clouds .
- [5] M. Devare , M. sheikhalishahi , L.Grandinetti (2009)," Virtualization: A Foundation for Cloud Computing ",International Journal of Networking and communication and Engineering .
- [6] Jiandun Li, Junjie Peng, Wu Zhang (2011),"An Energy-efficient Scheduling Approach Based on Private Clouds" , Journal of Information & Computational Science ,volume 8, Number 4 , 716-724.
- [7] http://en.wikipedia.org/wiki/First-come_first-served
- [8] <http://siber.cankaya.edu.tr/OperatingSystems/ceng328/node124.html>