IJCSE International Journal of Computer Sciences and Engineering Open Access
Review Paper Volume-4, Issue-2 E-ISSN: 2347-2693

Hybrid Approach to Round Robin and Priority Based Scheduling Algorithm

Garima Malik [1*] and Gaganjot Kaur[2]

[1*,2] *Department of Computer Science and Engineering,*
Manav Rachna University Faridabad, India

www.ijcseonline.org

Received: Jan /19/2016 Revised: Feb/02/2016 Accepted: Feb/12/2016 Accepted: Feb/29/2016

***Abstract*—** Cloud computing had become the most popular and powerful platform for scientific applications. Green cloud computing also share large scale of resources, storage, knowledge for the scientific researches. Issues in implementation of the Scheduling of job which was the most challenging issues in the green cloud computing area .Some of the implementation is been done in the area of the green cloud computing. This paper will focus on the implement the pre-emptive part of the proposed algorithm of the Hybrid Approach to Round Robin and Priority Based Scheduling Algorithm in green cloud computing.

***Keywords*—**Cloud;Green Cloud;Round Robin;Priority Based

I. INTRODUCTION

Green cloud computing is a sophisticated packet level simulator whose focus is on the optimizing, maximizing the energy consumption and the system throughput in the green cloud environment. The green cloud computing also offer a detailed modelling of the energy consumption by the data centre in many networking links. The green cloud is also use to develop workload scheduling as well as optimization in the network infrastructures.

Nowadays cloud computing has become a burning area for the scientific applications. Cloud computing intends to share a large scale resources and equipments of computation, storage, information and knowledge for scientific researches. Job scheduling algorithms is one of the most challenging theoretical issues in the cloud computing area. Some intensive researches have been done in the area of job scheduling of cloud computing. This paper focuses is on the Hybrid approach towards **Round** Robin and Priority Based Scheduling Algorithm in green cloud computing[1].

The main aim of the green cloud computing is to achieve the balance between quality of the service and resource consumption. The order to achieve the objective to maintain the flexibility of the green cloud is dynamic provisioning and the allocation strategies that are needed to manage the internal peaks of the workload. In this strategies to be optimize the use of the cloud resources while maintaining the service availability. The work to be introduces two hybrid strategies based on a distributed system management model and to describe the base strategies, analyzes, its base strategies and it presents the results. In the order to validate proposed strategies, we extended green cloud simulator.

II. GREEN CLOUD SCHEDULING

The major IT companies, such as Microsoft, Google, Amazon, and IBM, pioneered the field of cloud computing and keep increasing their offerings in data distribution and computational hosting. Green Cloud simulator is a packet level simulator that uses the existing Network Simulator 2 (NS2) libraries for energy-aware data centers for cloud computing[1]. It models the various entities of cloud such as servers, switches, links for communication and their energy consumption. It can be helpful in developing solutions for resource monitoring and allocation, scheduling workloads for number of users, optimizing the protocols used for communication and also provide solutions for network switches. The data center up gradation or extension may be decided using this tool. NS2 uses two languages C++ and TCL (Tool Command Language). The commands from TCL are usually passed to C++ using an interface TclCL. Green Cloud uses 80% of the coding is done using C++ (TclCL Classes) and remaining 20% coding is implemented using Tcl scripts (Commands are sent from Tcl to C++).

III. GREEN CLOUD FEATURES

Lower carbon emission is expected in green cloud computing due to highly energy efficient infrastructure and reduction in the IT infrastructure itself by multi-tenancy. The key driver technology for energy efficient Clouds is "Virtualization," which allows significant improvement in energy efficiency of Cloud providers. Virtualization is the process of presenting a logical grouping or subset of computing resources so that they can be accessed in ways that give benefits over the original configuration. By multiple virtual machines sharing same physical server at higher utilization, companies can gain high savings in the form of space, management, and energy.
Some of the features of the green cloud simulator are:-

1. Dynamic Provisioning: There are various reasons for such over-provisioning: a) it is very difficult to predict the demand at a time; this is particularly true for Web applications and b) to guarantee availability of services and to maintain certain level of service quality to end users. The infrastructure provisioned with a conservative approach results in unutilized resources. Such scenarios can be readily managed by Cloud infrastructure. The virtual machines in a Cloud infrastructure can be live migrated to another host in case user application requires more resources.

2**. Multi-tenancy:** The Green Cloud computing infrastructure reduces overall energy usage and associated carbon emissions. The SaaS providers serve multiple companies on same infrastructure and software. This approach is obviously more energy efficient than multiple copies of software installed on different infrastructure. The businesses have highly variable demand patterns in general, and hence multi-tenancy on the same server allows the flattening of the overall peak demand which can minimize the need for extra infrastructure.

3**. Server Utilization:** In general, on-premise infrastructure run with very low utilization, sometimes it goes down up to 5 to 10 percent of average utilization. Using virtualization technologies, multiple applications can be hosted and executed on the same server in isolation, thus lead to utilization levels up to 70%. Thus, it dramatically reduces the number of active servers. Even though high utilization of servers results in more power consumption, server running at higher utilization can process more workload with similar power usage.

4**. Datacenter Efficiency**: The power efficiency of datacenter has the major impact on the total energy usage of Cloud computing. By using such the most energy efficient technologies. This is achieved by using high speed network, virtualized services and measurement, and monitoring and accounting of datacenter.

IV. BENEFITS OF RUNNING GREEN CLOUD SIMULATOR

Use of the green cloud computing is to increase at a very fast place for everyone because it turns the capital expenditure of the basic cost into the operational cost. In addition to that, use of the simulation tools is to consider a better option in spite of being on the real cloud as performing experiments in a controlled and dependent environment is difficult and costly to handle .Moreover, effective resource utilization is not possible in case of Cloud. So, we just shift towards the green cloud simulation tools. Following are the following few advantages of the running simulation tools in green cloud:

1. **No capital cost involved**: The green cloud computing makes a shift from the capital expenditure cost to the operational cost. Having a green cloud simulation tool also involves having no installation cost or maintenance cost as well.

2. **Leads to the better results:** Using such a tool helps to change inputs and other parameters as well very easily which results in better and more efficient output

3. **Evaluation the risks at an early stage**: Because of the simulation tools involve no cost will be running as is in case of being on cloud, so user can identify and solve any of the risk that is been associated with the design or with any other parameter.

4. **Easy to learn**: While working with such a simulation tools, users will need to have only the programming abilities and rest all will depend on that. If the user is well versed with the language, then simulation tools offer no other problem.

These are the some of the advantages that are provided by the green cloud simulation tools.

TOOL USED

There are various simulation tools for the green cloud, some of which are as follows:

We will mainly discuss the three major cloud simulation models they are MDCSim, CloudSim and GreenCloud Simulator in terms of different parameters like the availability, the application models, the time taken for simulation to complete it, etc. Analyzing the performance into the real cloud is too difficult to achieve because of its altering nature, so in such a situation, we can opt for the green Cloud Simulator. The green Cloud Simulator is also famous tool that is actually a toolkit for the simulation of such a cloud scenarios.

MDCSim

The MDCSim is the variant towards the green Cloud Simulator tools. It also help the user to analyze and to predict the hardware related parameters of the basic data centers like those of servers ,switches and the routers. Also it has been used for the predominantly because of its low overhead productivity.

Parameters	MDCSim	CloudSim	GreenCloud
Communication Network	Limited	Limited	Full
Graphical Support	None	Limited(Cloud Analyst)	Limited(NetworkAnimator)
Availability	Commercial	OpenSource	OpenSource
Platform	CSIM	SimJava	NS2
Application Models	Computation	Computation and Data Transfer	Computation DataTransfer and Exec.deadline
Simulation Time	Seconds	Seconds	Tensof Minutes
Language/ Script	C++/Java	Java	C++oTcl
Physical Models	None	None	Available using plug in
Energy Models	Rough	None	Precise(servers + networks)
Support Of TCP/IP	None	None	Full
Power Saving Modes	None	None	DVFS, DNS And both

Green cloud simulator

The Green Cloud simulation environment is the advanced energy-aware studies of the green cloud computing data centers, developed as an extension of a packet-level network simulator (NS2). It offers a detailed fine-grained modelling of the energy consumed by the elements of the data center, such as servers, switches, and links. The green cloud simulator tool will be used will be the green cloud simulator tool will be based on the 2 languages C++ and TCL.

V. PROPOSED FRAMEWORK AND METHODOLOGY

The Basic methodology which is been used will be the following sets:-

1) Enter J={j1,...,Jm} a set of jobs and K={ k1,...,km} .
2) Enter C={c1,...,Cd} and D={d1,.....,dd} a set of resource.
3) For all the jobs to make the consistent comparison of the matrix according to the priority of resources accessibilities (d matrix with *m* row and *m* column)
4) Compute priority vector and the round robin vector for all the matrixes in step 3.
5) Make a matrix with priority and the round robin vectors in step 4 and name it.
6) For C and D compute a consistent comparison matrix according to decision maker(s).
7) Compute priority and round robin vector for matrix in step 6 same as step 4 and name it.
8) Compute *PVS* which is a vector included value of priority of jobs and the round robin jobs from it.
9) Choose a job with maximum amount of priority value based on *PVS* and allocate it suitable resource.
10) Update the list of jobs.
11) End.

CONCLUSION

The hybrid approach algorithm in green cloud computing will make use of the proposed algorithm toward preemptive part of the scheduling algorithm. The algorithm used robin and priority based scheduling algorithm .Our proposed algorithm of the green cloud scheduling the use of preemptive priority job scheduling algorithm in cloud computing. Our algorithm focuses on reducing the power cost. The computing server is selected on the basis of which satisfies the minimum resource requirement of a job as per the best fit. Resources are allocated based on the best allocation scheme. This method creates a balance between energy consumption and load on the servers. The main objective is to implement such an algorithm that entirely focuses to minimize the carbon footprints and maximizing the resources according the suitability of the servers.

REFERENCES

[1] Gaganjot Kaur and Sugandhi Midha ,'A Preemptive Priority Based Job Scheduling Algorithm in Green Cloud Computing',2016.
[2] D. Kliazovich, P. Bouvry, and Samee U. Khan,' DENS: Data Center Energy-Efficient Network-Aware Scheduling ',IEEE/ACM International Conference on Green Computing and Communications (GreenCom), Hangzhou, China, 2010
[3] Domagoj Jakobovi´c et al, Evolving priority scheduling heuristics with genetic programming, Applied Soft Computing (2012) 2781–2789
[4] Shamsollah Ghanbari,Mohamed Othman,' A Priority based Job Scheduling Algorithm in Cloud Computing',Science Direct',2012.
[5]. Chengpeng Wu ,Junfeng Yao , Songjie "Cloud computing and its key techniques," Electronic and Mechanical Engineering and Information Technology (EMEIT), 2011 International Conference on , vol no. 1, p.320-324, 12-14 Aug. 2011(IEEE).
[6]. Xiaonian Wu, Mengqing Deng , Runlian Zhang , Bing Zeng,Shengyuan Zhou "A task Scheduling algorithm based on QOSdriven"International conference on Information Technology and quantitative Management(ITQM) ,p 1162-1169 , ELSEVIER(2013).
[7]. Huankai Chen, Frank Wang, Na Helian, Gbola Akanmu "User-Priority Guided min-Min Scheduling Algorithm for Load Balancing in cloud computing" National conference on Parallel computing technologies , p 1-8, 21-23 Feb 2013(IEEE)
[8]. Buyya Raj kumar, "Cloud Computing: Principles and Paradigms", Wiley, 2011 .