Profit Model for admission control and resource scheduling for optimum utilization of resources in Cloud Computing Environment

Ms. Nikky Ahuja[1] Dr. Priyesh Kanungo[2] Dr. Sumant Katiyal[3]

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ABSTRACT

Globalization has brought many changes in modern business world. Problems of enterprise-oriented software applications like distribution and configuration of resources presents challenge to the traditional software sales model. Cloud computing presents the solution for such problems. With the help of cloud-based model one can earn good return by making the QoS demands of their users (customers) satisfied. In order to fulfill the infrastructure demands (like network, storage, etc.) to their users, service providers have to maintain their own hardware or they lease it from the IaaS providers. For maintaining their own hardware SaaS providers will have to incur an extra cost, but if taken on lease, zero maintenance cost involved. Moreover, if provider wants to optimize cost and gain customer satisfaction, they will have to satisfy their customers/users by maintaining service level objectives. This paper presents a model for resource allocation in such a way as to minimize cost and maximize profit by satisfying the service level needs of the customers. The model is designed to enable the service providers with an ability to cope with the changing needs of customers, mapping customer requests to infrastructure level parameters and better handling of heterogeneous VMs.

KEYWORDS

Cloud computing, Service Level Agreement (SLA), Quality of Service (QoS), Scheduling, Software as a Service (SaaS).

1. INTRODUCTION

Cloud providers allow users to access application via internet without making an investment in software and other infrastructural resources. SaaS providers either use their own resources or the rented one to serve their customers [1] [2]. But there are certain limitations associated like hosting an in-house resource system can increase the administrative cost, on the other hand, renting may affect the QoS as performance of IaaS varies [8]. Present work is an attempt to meet these challenges. In this paper, a new and innovative model is proposed for admission control and resource scheduling for optimum utilization of cloud resources in public domain. This will help SaaS providers to attain its objectives of cost, profit and customer satisfaction. Cloud computing technology has made data computation more efficient by the centralization of resources. One of the most significant benefits of cloud includes resource optimization and its two prime goals are the client satisfaction and cost minimization [7].

Traditional service provider allocates each customer with an individual virtual machine to meet service requirements that results in increased cost due to poor utilization of hardware as it is possible that customer doesn't use the complete VM capacity as is reserved for customer's request. Hence, multi-tenancy strategy could be used to reduce resource cost by keeping in view service level constraints. This would reduce SLA violation also.

2. LITERATURE SURVEY

In the Cloud, computing resources need to be scheduled in a way that providers achieve high resource utilization and users meet their applications performance requirements with minimum expenditure.

As per Swarupa and Shahu [11] the main aim of service provider is to satisfy customer without violation the quality constraint. An extensive evaluation study was conducted by authors to find best solution to increase profit by minimizing cost and improving customer satisfaction level. Paper presented various scheduling strategies and algorithm to provide efficiently resource allocation and increase profit for SaaS provider. Jun Nie [3] in his research has formulated an algorithm based on genetic and ant colony algorithm for improving the efficiency of task scheduling in CCE. Their work has used load balance of resources as base and set an important criterion for the completion of task. This has resulted in an obvious advantage over traditional genetic algorithms.

Sukhpal and Inderveer [12] have worked for appropriate allocation of resources to cloud workloads as per the QoS requirements. The focus of their study was analysis of cloud workload, categorization of workloads on the basis of common patterns and then provisioning of workloads before

[1] *Research Scholar, School of Computer Science and IT, DAVV, Indore (M.P.), Email: ahuja_nikky@yahoo.co.in*
[2] *Professor, School of Computer Science and IT, DAVV, Indore (M.P.), Email: priyeshkanungo@hotmail.com*
[3] *Professor, School of Electronics, DAVV, Indore (M.P.), Email: sumant578@yahoo.com*