

## EQUAL: ENERGY AND QoS AWARE RESOURCE ALLOCATION APPROACH FOR CLOUDS

Ashok KUMAR, Rajesh KUMAR, Anju SHARMA

*Department of Computer Science and Engineering*

*Thapar University*

*Patiala-147004, India*

*e-mail: ashok.khunger@gmail.com, {rakumar, anju.sharma}@thapar.edu*

**Abstract.** The popularity of cloud computing is increasing by leaps and bounds. To cope with resource demands of increasing number of cloud users, the cloud market players establish large sized data centers. The huge energy consumption by the data centers and liability of fulfilling Quality of Service (QoS) requirements of the end users have made resource allocation a challenging task. In this paper, energy and QoS aware resource allocation approach which employs Antlion optimization for allocation of resources to virtual machines (VMs) is proposed. It can operate in three modes, namely power aware, performance aware, and balanced mode. The proposed approach enhances energy efficiency of the cloud infrastructure by improving the utilization of resources while fulfilling QoS requirements of the end users. The proposed approach is implemented in CloudSim. The simulation results have shown improvement in QoS and energy efficiency of the cloud.

**Keywords:** Energy efficiency, resource utilization, resource allocation, antlion optimization, quality of service

### 1 INTRODUCTION

Cloud computing delivers Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS) [1] on pay per usage basis. These services are provided through shared pool of configurable computing resources such as networks, servers, storage, and applications, which are rapidly provisioned and released on demand. The liability of resource management lies with the service provider. This effortless computing paradigm (from the point of view of cloud users) has resulted