Abstract

As energy consumption is becoming a problem in cloud data centers, cloud service providers have adopted different techniques to address this problem. One of the most attractive technique is virtual machine (VM) consolidation. Apart from reducing energy consumption in computing platforms, this technique has other advantages such as reduced infrastructure costs and ease of virtual machine management. However, VM consolidation, which does not recognize workload characteristics may, in the long run, increase energy consumption and lead energy wastage. This paper investigates the relationship between different VM workload types and server energy consumption in a multi-tenant datacenters. Experiments are conducted using well known CPU, I/O, memory and network intensive workload benchmark obtained from Phoronix Test Suite (PTS). Results obtained show that there is a noticeable difference in the amount of energy consumed when VMs run workloads, which dominate the various server physical resources. Secondly, consolidating homogeneous workloads is disastrous in terms of energy consumption and performance over heterogeneous workloads. The latter can further reduce
energy consumption and achieve acceptable performance levels if an optimum workload mix is reached.

References


Index Terms

Computer Science                                  Distributed Computing

Keywords

Cloud computing, cloud workloads, data center energy consumption, cloud workload consolidation, multi-tenant cloud, IaaS