Energy-Aware Task Consolidation Technique for Cloud Computing

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Abstract

Task consolidation is a way of maximizing cloud computing resource, which brings many benefits such as better use of resources, rationalization of maintenance, IT service customization, QoS and reliable services, etc. However, maximizing resource utilization does not mean efficient energy usage. Many literature show that energy consumption and resource utilization in clouds are highly coupled. Some research works aim to decrease resource utilization for saving energy while some try to find the balance between resource utilization and energy consumption. In this paper, an energy-aware task consolidation (ETC) technique is presented aims to optimize energy consumption of virtual clusters in cloud data center. Conforming most cloud systems, a 70% principle of CPU utilization is proposed to manage task consolidation among virtual clusters. The simulation results show that ETC can significantly reduce power consumption in managing task consolidation for cloud systems. Up to 17% improvement as compare to a recent work in [10] that aims to maximize resource utilization can be obtained.

Keyword：energy efficient; task consolidation; cloud