

Abstract: PasDis: A Dynamic Power-Aware Service Distribution Policy on Homogeneous Clusters

Song Wu, Gezhi Yan, Li Deng, Xuanhua Shi, Hai Jin
*Services Computing Technology and System Lab
Cluster and Grid Computing Lab
School of Computer Science and Technology
Huazhong University of Science and Technology, Wuhan, 430074, China
wusong@hust.edu.cn, hjin@hust.edu.cn*

Abstract

Virtual machines are often used in cluster environments due to their outstanding ability of management and provisioning. As the concept of green computing attracts much attention nowadays in cluster computing, dynamic consolidation that both decreases the power consumption and raises resource utilization of clusters is applied commonly. Dynamic consolidation is an approach that redistributing virtual machines to physical machines within a cluster as their computational requirements change. Previous consolidation strategies primarily use only local optimization and typically do not take migration overhead into account. In this paper, we propose a power-aware service distribution policy on homogeneous clusters which not only consolidates the under-load servers, but also decreases the cost of reconfiguration. The experimental measurements across 10 workload classes and 3 configurations of virtual machines show that compared to Load Balancing method the new policy reduces the power consumption of the cluster by 24% while improves the resource utilization to up to 65%. The performance loss is also acceptable.

Acknowledgment

This work is supported by NSFC under Grant No.61073024, 60973037 and 61133008, Outstanding Youth Foundation of Hubei Province under Grant No.2011CDA086, Research Fund for the Doctoral Program of MOE under Grant No 20110142130005.