RESEARCH ARTICLE

Energy Conscious Dynamic Provisioning of Virtual Machines using Adaptive Migration Thresholds in Cloud Data Center

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Abstract— The fast growing demand for computational power utilized by modern applications with rapidly changing Cloud computing technology have directed to the foundation of large-scale virtualized data centers. Such data centers consume massive amounts of electrical energy resulting in high operating costs and carbon dioxide (CO_2) emissions. Dynamic consolidation of virtual machines (VMs) using Dynamic migration and switching off idle nodes to the sleep mode provide better optimized resource usage, lower energy consumption, which provides high performance & better quality of service. However incompatibility between specification of physical machine and user requests in cloud, leads towards problems like poor load balancing, energy-performance trade-off and large power consumption etc. Also the VM placement should be optimized continuously in an online manner because of fast varying workloads in current application. To understand the inferences of the online behaviour of the problem, we conduct competitive analysis of optimal online deterministic & Adaptive Migration Thresholds based algorithms for the single VM migration and dynamic VM consolidation problem.

Concentrating at this issue, this paper presents an energy conscious, power aware load balancing strategy based on adaptive migration of virtual machines (VMs). This strategy will be applied to virtual machines on cloud, considering higher and lower thresholds for migration of virtual machines on the servers also here we consider RAM & Bandwidth for better performance & load balancing. If the load is greater or lower then defined upper & lower thresholds, VMs will be migrated respectively, boosting resource utilization of the cloud data center and reducing their energy consumption. To reduce number of migration we integrate minimum migration time policy which is capable of reducing the number of migration and the energy consumption of virtual machine migration also achieves load balancing and meet service level agreement (SLA) requirements. This document gives formatting instructions for authors preparing papers for publication in the Proceedings of an IEEE conference. The authors must follow the instructions given in the document for the papers to be published. You can use this document as both an instruction set and as a template into which you can type your own text.

Key Terms: - Cloud Computing, Virtual Machines, Reducing Energy, Dynamic Provisioning, Service Level Agreement (SLA), Adaptive Migration Thresholds, Resource Allocation.

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