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# Adaptive Selection of Dynamic VM Consolidation Algorithm using Neural Network for Cloud Resource Management

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**Abstract**

Cloud resource management becomes more important with the increasing usage of cloud resources. With various cloud options available, cloud provider may have different priority in managing the resource through resource scheduling and provisioning. Dynamic VM (Virtual Machine) consolidation algorithm is one of the techniques which can be used to reduce energy consumption through VM migration. Higher VM migration may lead to lower energy consumption and higher SLA violation. Although previous research has succesfully decreased energy consumption and SLA violation, cloud providers may need to manage trade-offs between energy and SLA violation through availability of priority in the system. This paper proposes neural network-based adaptive selection of VM consolidation algorithms which adaptively chooses appropriate algorithm according to cloud provider's goal priority and environment parameters. Dataset generation and performance evaluation using simulations on real-world PlanetLab VMs workload trace showed that adaptive selector produced better average performance score than independent methods on various evaluation priority.

*Keywords:* cloud computing, infrastructure as a service, resource management, dynamic consolidation, virtual machine migration, neural network

## 1. Introduction

Cloud computing is the technology to enable provisioning of resources (hardware and software) over the Internet. The pay-as-you-go pricing gives opportunity for cloud users to eliminate up-front cost [1]. Cloud resource management is important because it affects performance, functionality, and cost of a cloud system [2]. The integration of Internet of Things and cloud computing (Cloud of Things) for developing smart applications [3] will increase the number of cloud computing usage and the importance of cloud resource management.

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