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Moslem Habibi, MohammadAmin Fazli, Ali Movaghar

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Efficient Distribution of Requests in Federated Cloud Computing Environments Utilizing Statistical Multiplexing

Moslem Habibi, MohammadAmin Fazli, Ali Movaghar

Department of Computer Engineering, Sharif University of Technology, Tehran, Iran

Abstract

One of the main questions in cloud computing environments is how to efficiently distribute user requests or Virtual Machines (VMs) based on their resource needs over time. This question is also an important one when dealing with a cloud federation environment where rational cloud service providers are collaborating together by sharing customer requests. By considering intrinsic aspects of the cloud computing model one can propose request distribution methods that play on the strengths of this computing paradigm. In this paper we look at statistical multiplexing and server consolidation as such a strength and examine the use of the coefficient of variation and other related statistical metrics as objective functions which can be used in deciding on the request distribution mechanism. The complexity of using these objective functions is analyzed and heuristic methods which enable efficient request partitioning in a feasible time are presented & compared.

Keywords: Cloud Computing, Cloud Federation, Multiclouds, Request Partitioning, Statistical Multiplexing

Email addresses: moslem_habibi@ce.sharif.edu (Moslem Habibi), fazli@sharif.edu (MohammadAmin Fazli), movaghar@sharif.edu (Ali Movaghar)

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