Decision Support Tool for IoT Service Providers for Utilization of Multi Clouds

Mohammad Mahdi Kashef, Hyenyoung Yoon, Mehdi Keshavarz, Junseok Hwang

Technology Management, Economics and Policy Program Department of Industrial and Management Engineering College of Engineering, Seoul National University

mmkashef@snu.ac.kr, hyyoon00@snu.ac.kr, keshavarzm@snu.ac.kr, junhwang@snu.ac.kr

***Abstract*— The Internet of Things (IoT) refers to uniquely identifiable objects (things) and their virtual representations in an Internet-like structure. IoT service Providers (IoTSP), i.e. the companies who intend to offer IoT-based services, may utilize cloud computing which offers a cheap, ubiquitous, unlimited and elastic solution for the supporting infrastructure. In this way the IoTSP will deploy its Virtual Machines (VM) on various cloud service providers (multi clouds) to have satisfactory coverage and performance for its globally distributed users.**

In this context, one of the major problems is to minimize the overall cost of cloud infrastructure while keeping satisfactory level of performance. To achieve this the IoTSP has to cost-optimally place its VMs on the available cloud service providers.

This paper proposes a decision support tool for IoTSP to find their cost-optimum VM placement on multi clouds. The tool comprises a cost estimation model as well as an optimization algorithm. Our decision support tool is examined by several simulation scenarios and the results demonstrate the working of the tool.

***Keywords*— Internet of Things, IoT Service Providers, cloud computing, multi Clouds, Decision Support Tool, cost estimation, cost optimization, VM placement**

Mohammad Mahdi Kashef (mmkashef@snu.ac.kr) is a Ph.D. student at the Technology Management, Economics, and Policy Program (TEMEP) of the College of Engineering, Seoul National University. His research interest is economics of Internet-of-Things, economics of cloud computing, service placement in clouds, cost-optimization

Dr. Hyenyoung Yoon (hyyoon00@snu.ac.kr) is a visiting professor for Technology Managment, Economics and Policy Program at Seoul National University in Korea. Prior to this, she worked as a senior researcher in a Korea Communications Agency and LG Electronics. She received her Ph.D. in Technology Management Economics and Policy Program from Seoul National University, a Master‘s degree in Information and telecommunication engineering from Ewha Woman‘s University. Her current research interests are internet of things, personal information protection, resource management for cloud computing and spectrum management policy.

Mehdi Keshavarz (keshavarzm@snu.ac.kr) is a Ph.D. student at the Technology Management, Economics, and Policy Program of the College of Engineering, Seoul National University. His research interest is cloud computing, cloud federation, and simulation.

Prof. Junseok Hwang (junhwang@snu.ac.kr) is professor of Information Science and Technology at Technology Management, Economics and Policy program (TEMEP), Seoul National University and Director of International Technology Policy Program (ITPP). Prior to this, he was an Assistant Professor in the School of Information Studies at Syracuse University. He received his Ph.D. in Information Science and Telecommunications from the University of Pittsburgh, a Master's degree in Telecommunications from the University of Colorado. His current research focuses on economics of information and network s, management and policy of convergence technologies, social impact study and forecasting of emerging technologies, knowledge management, patent research and policy analysis. On this topic of research, he is actively working for Digitalogy, and Technology and Humanities Convergence study.