

Chapter 66

Adoption of Virtualization in Cloud Computing: A Foundation Step towards Green Computing

Nusratullah Khan

International Islamic University Malaysia, Malaysia

Asadullah Shah

International Islamic University Malaysia, Malaysia

Kajal Nusratullah

International Islamic University Malaysia, Malaysia

ABSTRACT

There has been rapid expansion of the information technology due to contribution to emission of carbon dioxide. The cloud computing technology has been perceived to present solution to various studies that try to investigate on the most appropriate ways of reducing the carbon dioxide gas emissions. The current study aimed at investigating the adoption of virtualization in cloud computing as a means through which the green computing can be achieved. According to the paper virtualization among its many process helps in curtailing equipment required through cloud computing resources to facilitate adequate use of resources to make use of energy and assets.

INTRODUCTION

There has been an alarming upsurge in IT departments in most organizations due to the increased usage and demand for high speed networks. This increased proliferation is handled by large scale datacenters that amalgamate large number of servers possessing infrastructure like cooling, storage and network system. The operation of datacenters can be accomplished using internet service providers. Traditionally, a large amount of time and money were infused by businesses to procure the computational resources.

DOI: 10.4018/978-1-5225-0788-8.ch066

Ownership based approach had been deteriorating and is replaced by subscription oriented approach as a result of cloud computing emanation through bestowing the access to the demanded services and establishing the foundation. As a result any accumulated information can be easily shared by users (Luo, 2010).

DISCUSSION

Organizations must not worry about configuring, administering and buying the computational foundations. As a result, they should concentrate on cuspitation of their expertise through exploiting the godsend of cloud computing such as low charges on software development. Cloud computing involves consumes a lot of power in processing data. However, the increased demand for cloud computing has surpassed the energy devastation for most data centers raising a lot of contention. The major drawback to cloud computing is the increased carbon emission that affects the environment due to the huge translation costs involved that abate profit advancement of the cloud providers. This creates the need to curtail cloud computing impacts on environment through enforcing energy efficient solutions (Trivedi, 2011).

Therefore, virtualization of cloud computing and consolidation of technology can enhance energy efficiency of data centers due to the exasperating problems in carbon emission and global warming. Data centers are prone to extenuation of maximum utilization rates for data centers. It is therefore in the heart of business to enforce green IT through use of increasing the energy efficiency.

CLOUD COMPUTING

Cloud computing refers to various computing concepts involving large number of computers that are connected through real time communication networks such like internet. This describes the ability to run applications or programs on several interconnected computers concurrently. The phrase refers network based services provided by real time servers and served by virtual hardware simulated by the software running on real machines. Cloud computing entails commercialization of the advancement that conveys computing as a pay-as-you-go basis, and a cloud provider aims at reducing the electricity costs instead of carbon emissions. Since cloud computing is among the emanating technologies, and this raises the questions on sustainability (Sherringham, 2011).

VIRTUALIZATION

Virtualization refers to the creation of virtual version of a resource that divides the resource into single or multiple execution environments. This is critical in cloud computing as it enhances scalability since every server is allocated enough storage and computing power needed by a client. The increased demand for user capacity requires more power and capacity (Bianchini et al., 2012).

Virtualization is changing the IT environment where most companies have been able to adopt it as a measure that allows for better utilization of hardware and reduction of costs (see Figure 1). One of the major benefits of virtualization that go unnoticed is the green computing (Sherringham, 2011).

6 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

www.igi-global.com/chapter/adoption-of-virtualization-in-cloud-computing/161090

Related Content

Optimized Base Station Sleeping and Smart Grid Energy Procurement Scheme to Improve Energy Efficiency

Qiang Wang and Hai-Lin Liu (2018). *Critical Developments and Applications of Swarm Intelligence* (pp. 357-378).

www.irma-international.org/chapter/optimized-base-station-sleeping-and-smart-grid-energy-procurement-scheme-to-improve-energy-efficiency/198933

Intelligent Visual Tracking in Unstabilized Videos

Kamlesh Verma, Debashis Ghosh, Harsh Saxena, Himanshu Singh, Rajeev Marathe and Avnish Kumar (2020). *International Journal of Natural Computing Research* (pp. 54-75).

www.irma-international.org/article/intelligent-visual-tracking-in-unstabilized-videos/258960

Intelligent Decision Making Through Bio-Inspired Optimization: Ant Colony Optimization for Real-World Scenarios

J. Angel Ida Chellam, Preethi Muthukumar and M. Senthamil Selvi (2024). *Intelligent Decision Making Through Bio-Inspired Optimization* (pp. 51-63).

www.irma-international.org/chapter/intelligent-decision-making-through-bio-inspired-optimization/344563

Decoding Algorithm by Cooperation Between Hartmann Rudolph Algorithm and a Decoder Based on Syndrome and Hash

My Seddiq El Kasmi Alaoui and Said Nouh (2021). *International Journal of Natural Computing Research* (pp. 15-27).

www.irma-international.org/article/decoding-algorithm-by-cooperation-between-hartmann-rudolph-algorithm-and-a-decoder-based-on-syndrome-and-hash/274935

Corticofugal Modulation of Tactile Responses of Neurons in the Spinal Trigeminal Nucleus: A Wavelet Coherence Study

Eduardo Malmierca, Nazareth P. Castellanos, Valeri A. Makarov and Angel Nuñez (2009). *Advancing Artificial Intelligence through Biological Process Applications* (pp. 1-19).

www.irma-international.org/chapter/corticofugal-modulation-tactile-responses-neurons/4969