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SERVmegh:Framework for Green Cloud

Ashok Kumar · Anju Sharma · Rajesh Kumar

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Abstract With the growing popularity of cloud computing, different IaaS (Infrastructure as a Service) cloud frameworks do exists. Each framework has significant impact on robustness, scalability, fault-tolerance, energy efficiency etc. of the cloud. To bring good characteristics of open source clouds and commercial clouds under a roof, a six layered green cloud framework namely SERVmegh is proposed. Comparative analysis of different cloud frameworks is presented, and a detailed description of each layer of proposed framework and its components is also given. Resource management, workload analyzer and manager, and on/off control components of proposed framework are designed and implemented. Energy-efficient resource wastage reduction methodology for resource management is proposed. Algorithms for resource management, virtual machine (VM) placement, and minimization of number of VM migrations using resource wastage reduction methodology are also proposed and implemented. We have validated our algorithms by conducting a performance evaluation study using CloudSim toolkit. The results demonstrate that proposed framework i.e. SERVmegh has immense potential as it offers significant energy savings under different scenarios.

Keywords Energy efficiency · Cloud framework · Resource management in cloud · Virtualization

Ashok Kumar
Thapar University, Patiala
E-mail: ashok.khunger@gmail.com

Anju Sharma
Thapar University, Patiala
E-mail: anjusharma@thapar.edu

Rajesh Kumar
Thapar University, Patiala
E-mail: rakumar@thapar.edu