On Cost and Energy Efficiency of Security in Cloud Computing

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Abstract

Clouds are virtualized datacentres and applications offered as services. Cloud datacentre hosts hundreds of servers with software and hardware constituents that requires huge amount of energy for its operation. This poses energy consumption challenge, as well as server consolidation and data security due to the required technologies. This study, therefore, focuses on the cost effectiveness and energy efficiency of securing the cloud. Cost, in this context, is the continuous efforts made by cloud vendors in maintaining and ensuring that cloud infrastructures are equipped with state-of-the-art facilities that are energy efficient and conform to Power Usage Effectiveness (PUE), Service Level Agreements (SLAs) and Quality of Service (QoS) standards. Various factors that causes inefficiency in the cloud are considered in addition to conducts that ensure cost effective and energy efficient security in the cloud were evaluated using cloudsim and cloudreports, toolkits for modelling and simulating cloud environment as well as the feasibility of reducing the energy consumed in datacentres. The experimental results using Power Usage Effectiveness (PUE) and DataCentre Infrastructure Efficiency (DCIE) techniques for analyzing the energy consumed in datacentres demonstrates enhanced cloud
productivity is achievable with reduced energy consumption in datacentres.

References


**Index Terms**

Computer Science  
Security

**Keywords**

Energy, Cost, Security, Quality of Service (QoS), Power Usage Effectiveness (PUE), DataCentre Infrastructure Efficiency (DCIE)