Performance Analysis of Cloud Hypervisor Using Network Package Workloads in Virtualization

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J. Mary Ramya Poovizhi ; R. Devi **All Authors**

Abstract:
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Abstract:
AWS (Amazon Web Services), Microsoft Azure, Cloud Zero, Kubernetes, and Google App Engine are cloud computing service providers that can manage client workloads and applications through virtualization and containerization. Computing resources are provided by large data centres that consume large amounts of Energy, contributing to global warming. Today's businesses and economies rely heavily on cloud data centres, the world's fastest-growing power users. The latest DCN has two main challenges: scalability and efficiency. A DCN's design directly impacts its scalability, but its power consumption is a significant factor in its cost. If this trend continues, many scientists predict that servers will consume more Energy over their lifetime than they cost. Large-scale infrastructure facilities such as clustering, grids, and clouds of thousands of heterogeneous computers present even more significant energy consumption problems. This paper addresses the energy consumption problem of the hypervisor shown in the cloud data centre. A single hypervisor does not exhibit the same performance on all platforms as other hypervisors in terms of power and energy consumption. Several vital conclusions presented in this paper will provide system designers and operators of data centres with valuable insights that will assist them in placing workloads and scheduling virtual machines in the most power-aware manner. Researchers in this paper provide insight into power-aware workload placement and VM scheduling for system designers and operators.

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I. Introduction

An extensive system, such as a cloud, a cluster, or a grid, will have numerous nodes involved in network processing. Compared to single systems, these systems perform many modern tasks. Supercomputers and clusters are used for large-scale weather forecasting, space research, encryption strength testing, and medical drug development[1] [2] driven by the demand of user applications in past few decades, particularly from 1990 to 2010. However, due to their ever-increasing energy demand which causes large energy bills and CO_2 emissions, over the past six years the focus has shifted towards energy-performance aware. The average energy consumption of servers is increasing continuously; and several researchers suggest, if this trend continues further, the cost of energy consumed by a server during its lifetime will exceed the hardware costs. The energy consumption problem is even greater for large-scale infrastructures, such as clusters, grids and clouds, which consist of several thousand heterogeneous servers. Efforts are continuously made to minimize the energy consumption of these systems, but the interest of people in computational services and popularity of smart devices make it a difficult task. In this paper, we discuss the energy consumption of ICT equipment, and present a taxonomy of energy and performance efficient techniques for large computing systems covering clusters, grids and clouds (datacenters. Grid and cloud computing systems are more stable and scalable, lower acquisition costs, and offer distributed applications (monolithic vs. microservices) over non-distributed methods.

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