UNIVERSITI TEKNOLOGI MARA

QOS ON TYPE-2 HYPERVISORS IN VIRTUALIZED ENVIRONMENT

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ABSTRACT

Virtualization has become a widely discussed topic nowadays, both for servers as well as for desktop systems. It involves the concepts of host operating system, guest (virtual) operating system and hypervisor. Hypervisor or Virtual Machines Monitor (VMM) is the machines where guest operating system resides. There are number of studies have been conducted in this field, especially those involving the hypervisor virtualization (Type-2). However, further research is needed in measuring network performance in terms of TCP Window Size, I/O file system performance and Web Server connectivity in virtualized environment; especially on another operating system such as Lubuntu 14.04, which is the lightest version of Ubuntu operating system. The objectives of the work is to determine a web server average successful connection lifetime from Lubuntu resides in hypervisors, to evaluate the network performance in terms of bandwidth (TCP), jitter (UDP) and changes in TCP window size; and to verify the performance of the results by measuring the I/O file system (1 MB, 32 MB, 512 MB, and 2 GB) in terms of read/write operation process. In this work, two test beds have been constructed; focusing on Intel based platform and AMD based platform. Benchmarking tools such as Iperf, Httperf and Iozone were installed inside virtual machines (Windows 7 and Lubuntu 14.04) reside in the type-2 hypervisors (VMware and VirtualBox). Overall, VMware performs better in terms of bandwidth, jitter (Lubuntu), web server average connection lifetime and I/O read operation compared to VirtualBox. In general, for both test bed, VMware consistently outperform VirtualBox in most aspect of the test done.

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INTRODUCTION

1.0 INTRODUCTION

This chapter explains the overview of the research work starting from the research background. Next, followed by the problem statement will be discussing on the needs of this study to be carried out. After that, research questions, objective, the scope of study, significance of study and organization of thesis will be explained accordingly.

1.1 BACKGROUND OF STUDY

Virtualization is a framework of creating a virtual version or using the resources of a computer in order to create multiple execution environments such as a virtual operating system (OS), storage device or computer network resources. In other words, the capability of real machine to create multiple instances of virtual machines provided by a specific layer of software or abstraction layer also known as hypervisors. Although virtualization brings advantages such as improved utilization, performance isolation, increased availability, fault tolerance, security, flexibility, ease the configuration and low cost in terms of electricity consumption; but it also has disadvantage in overhead performance. That is the main reason, why virtualization has become an interesting and important topic nowadays because from this experiment; users may choose the best hypervisor should be installed due to many versions of virtualization products have been created. Wang (2012) mentioned that in virtualization, there is a software or firmware that creates a virtual machine on the host that is known as hypervisor or Virtual Machine Monitor (VMM).VMM plays a role as the core component of virtual machine (VM) system as the performance of the system is relied on the effectiveness of this VMM (Jianhua, 2008).