IMPLEMENTATION AND ANALYZING NETWORK SERVICES THROUGH VIRTUAL SERVER ENVIRONMENT

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I hereby declare that this project report entitled

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Is written by me and is my own effort and that no part has been plagiarized without citations.

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DEDICATION

Specially dedicated to my beloved parents, En Mustafa bin Mohammad and Puan Che Tempawan bt Din

For my supervisor, En. Mohammad Radzi Motsidi at Kolej Universiti Teknikal Kebangsaan Malaysia (KUTKM)

And lastly to my entire friends who have encouraged, guided and inspired me throughout my journey of education.

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ABSTRACT

Implementation and analyzing network services through Virtual Server environment is based on new technology of Virtual Server. This project will explain how to implement Virtual Server Hosted Architecture. There are several Virtual Server used Hosted Architecture such as VMware GSX server and Microsoft Virtual Server 2005 R2. This analysis will use Microsoft Virtual Server 2005 R2. The implementation is including installing two different Operating system, Microsoft Windows Server 2003 and Linux Fedora Core 4.0 in Virtual Server. Then 3 network services will up in Virtual Server. The implementation also include setup three dedicated server with different Operating System and basic network services. The analysis analyzes the CPU usage, memory usage, service response time, packet loss and availability. The result of analysis will use to compare dedicated server with Virtual Server. The analysis will show is it worth it to use Virtual Server.

ABSTRAK

Perlaksanaan dan analisis servis rangkaian komputer dalam persekitaran komputer maya adalah berdasarkan teknologi baru komputer maya. Projek ini akan menceritakan bagaimana hendak membangunkan rekabentuk hos komputer maya. Terdapat beberapa jenis komputer maya seperti "VMware GSX server" dan "Microsoft Virtual Server 2005 R2". Analisis ini akan menggunakan "Microsoft Virtual Server 2005 R2". Perlaksanaan projek ini akan menggunakan dua sistem pengoperasian yang berbeza iaitu Microsoft Windows 2003 Server dan Linux Fedora Core 4.0 di dalam komputer maya. Tiga servis rangkaian akan di bangunkan di dalam komputer maya. Analisis ini akan menganalisis penggunaan CPU, penggunaan ingatan, masa tindakbalas servis, kehilagan paket dan kesediaan. Keputusan analisis akan digunakan untuk membandingkan dengan dedicated server dan lihat adakah berbaloi menggunakan komputer maya.

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ACRONYM	WORD
KUTKM	Kolej Universiti Teknikal Kebangsaan Malaysia
IP	Internet Protocol
Http	Hypertext Transfer Protocol
TCP/IP	Transmission Control Protocol/Internet Protocol
CDROM	Compact Disc Read Only Memory
OSI	Open System Interconection
OS	Operating System
PSM 1	Projek Sarjana Muda 1
NIC	Network Interface Card
LAN	Local Area Network
MB	megabytes
GB	gigabytes
VGA	Video Graphics Adapter
IT	Information Technology
PC	Personal Computer
RAM	Random Access Memory
VS	Virtual Server
VSHA	Virtual Server Hosted Architecture
VSBMA	Virtual Server Bare Metal Architecture
VM	Virtual Machine
FTP	File Transfer Protocol
DNS	Domain Name System
IT	Information Technology

SCSI	Small Computer System Interface
PCI	Peripheral Component Interconnect
SNMP	Simple Network Management Protocol
FTP	File Transfer Protocol
WWW	World Wide Web

CHAPTER I

INTRODUCTION

1.1 Project Background

Virtual Server is virtual infrastructure for departmental server consolidation and streamlining development and testing operations. Full support for Microsoft Windows and Linux platforms combined with advanced capabilities make virtual server is the most flexible and easily deployed server virtualization. Virtualization software simplifies computing infrastructure by partitioning and isolating servers in secure and transportable virtual machines each of which can run standard Windows, Linux, or NetWare operating systems and applications. To ensure high performance, each virtual machine has direct access to the host machine's resources such as CPU, memory, disk, networking, and peripherals.

These projects are to implement and analyze network services through Virtual Server environment. The purpose of this research is to study a new technology and analyze the Virtual Server Hosted Architecture. The analysis is about server performance and network performance. The reason of this analysis is to see does network services can perform better in virtual server than dedicated server. Virtual servers have two types, Virtual Server Hosted Architecture and Virtual Server Bare-Metal Architecture. My project is to analyze Virtual Server Hosted Architecture.

1.2 Problems Statements

The problems in dedicated server are hardware and software cost is high priced. The priced of the hardware and software per server will cost at least RM10,000. Then when the companies buy the server, the server can run only one Operating System and one Operating System can support one or two network services. This is under utilizing resources. When any companies need to provide new network services, the companies need to buy a new server and configure it until it ready to provide the services. This will increased server provisioning time. Sometimes server down, to troubleshoot the dedicated server, technicians or engineers need to go to the server for troubleshoot.

Otherwise now we have Virtual Server Hosted Architecture and Virtual Server Bare-Metal Architecture. So before any companies buy the virtual server, the companies must want to know is it worth it to buy Virtual Server Hosted Architecture or Virtual Server Bare-Metal Architecture. Are virtual servers just appropriate to big company or small company.

1.3 Objectives

- To implement the Virtual Server Hosted Architecture.
  By using Virtual Server software, Microsoft Virtual Server 2005

- To analyze the server performance and network performance in Virtual Server.
  By using network monitoring tools freeware to monitor the server and network performance in virtual server environment. Server performance will be monitor in CPU usage, memory usage and disk utilization. Network performance will monitor response time, packet loss and availability.

- To compare Dedicated Server with Virtual Server environments

By analyze the performance in dedicated server and virtual server, than the result will compare each other.

- To analyze Virtual Server really good to use in the small or big company. The analysis will compare virtual server and dedicated server which the output will show does virtual server really can reduce hardware cost.

1.4 Scopes

- The project will use 2 different Operating System which is Windows Server 2003 and Linux Fedora core 4.
- 3 network services will configure in each Operating System which is DNS (Domain Name Service), WWW (web server) and FTP (File Transfer Protocol).
- Use network monitoring tools which is adventnet OpManager manage engine to analyze server performance.
- Use Virtual Server Hosted Architecture, Microsoft Virtual Server 2005 R2.

1.5 Project Significance

The benefit from this project is to companies or education institution such as schools, colleges or university who wants to reduce the cost on their server, increased server utilizations, reduced server provisioning time, increased flexibility, scalability, productivity, availability and security. This project can convince the company before

they buy variable Virtual Server Hosted Architecture and Virtual Server Bare-Metal Architecture.

1.6 Expected Output

Expected output is the analyzing of network services in virtual server environment will show the performance of networks and servers are as same as dedicated server. This mean the virtual server really can perform such as server consolidation, development servers and test servers and can reduce hardware cost. This is because dedicated servers are extremely cost due to infrastructure cost (housing, cooling, connecting and providing powers to server), hardware cost (servers increase in capacity and computing power), software cost (software requires license) and management cost.

Perhaps this analysis will give an answer is virtual server worth it to small or big company. The company must be want to increase the return from their investment utilizing resource, provide higher levels of service to their end users, decrease complexity to improve manageability to their system and increase flexibility and responsiveness.

1.7 Conclusions

Conclusion of this chapter is this project will help and convince any company or education institution before they buy or implement virtual server. Perhaps this project will give an analysis output result that will help anyone who wants to implement virtual server. By use 2 different Operating System in virtual server is to analyze server

consolidation and each Operating System will configure 3 basic network services are to analyze the network and server performance.

CHAPTER II

LITERATURE REVIEW AND PROJECT METHODOLOGY

2.1 Introduction

Virtualization is almost as old as enterprise computing itself. First introduced in the 1960s to allow partitioning of mainframe hardware, it has been a mainstay of high-end proprietary server environments ever since. Today, virtualization is once again a hot topic of conversation in the data center because emerging technologies have the potential to remedy issues relating to resource utilization, efficiency, scalability and manageability.

Armed with virtual machines on commodity hardware, data center administrators hope to create new levels of flexibility and agility in their environments at a lower total cost of ownership.

In this chapter, it will cover in details of the literature review and project methodology used to success the project. An effective literature review will meet this requirement; Compare and contrast different authors' views on an issue, Group authors who draw similar conclusions, Criticize aspects of methodology, Note areas in which authors are in disagreement, Highlight exemplary studies, Highlight gaps in research, Show how your study relates to previous studies, Show how your study relates to the literature in general, and Conclude by summarizing what the literature says. Others also define the literature review as searching, collecting, analyzing, and studying and write conclusion from all debates and issued raised. In Implementation and Analyzing

Network Services through Virtual Server Environment, this chapter will focusing on the research on various project that also implement using the virtual server technology.

The project methodology is an important part that need to be focuses more and details to be sure the used and compatibility with the project. Because of it needs to be used or involve most. The functions of project methodology are to collect, analysis, design, distribute responsibilities and function of the system and lastly, knowing and suppose the expected result of the system when it is implement. On this project, the methodology is a Waterfall methodology.

2.2 Fact and Finding

Below are some of the fact and findings of the virtual server, network performance and server performance.

2.2.1 Theory and Concept

In process to understand well in this project, which is virtual server technologies, the following basic concept and some theories and analysis are required to make sure the practical and effective of the system:

2.2.2 Dedicated Server

A server is a computer system that provides services to other computing systems called clients over a network. The term is most commonly applied to a complete computer system today, but it is also used occasionally to refer only to the hardware or software portions of such a system. Servers today are physically similar to most other general purpose computers, although their hardware configurations may be particularly optimized to fit their server roles, if they are dedicated to that role. Many use hardware identical or nearly identical to that found in standard desktop PCs. However, servers run software that is often very different from that used on desktop computers and workstations (Server computing 2006:14) Dedicated Server is one server only run one Operating System and one service.

2.2.3 Virtual Server

Virtualization is an abstract concept that encompasses several definitions related to IT resource consolidation and management. Virtualization refers to the pooling of IT resources in a way that masks the physical nature and boundaries of those resources from resource users. In more concrete terms, virtualization is the decoupling of software from hardware. It is the abstracting of the software from the underlying implementation. Virtualization can take place at various points in server architecture between the application and operating system (middleware clustering or containers) or between the operating system and hardware (Virtualization 2006:10).

This blend of virtualization technologies or virtual infrastructure provides a layer of abstraction between computing, storage and networking hardware, and the applications running on it (Virtualization 2006:10). The architecture of server layer before virtualization and after virtualization is shown below.