UNIVERSITY TEKNOLOGI MARA

QUALITY OF SERVICE (QoS) IN SOFTWARE DEFINED NETWORKING (SDN) USING BANDWIDTH SHAPING IN CLOUD COMPUTING

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Table of Contents

CHAPTER 1

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 BACKGROUD 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.

Virtualization has changed the way we do computing; for instance, many datacenters are entirely virtualized to provide quick provisioning, cloud infrastructure, and improved availability during periods of disaster recovery. Further, the adoption of virtualization shows no signs of slowing. A recent Gartner report estimates that while 12% of x86 workloads are virtualized today, this number will grow to 61% by 2013 (Gartner, 2013). And recently, Intel has stated their goal for all end hosts to be virtualized .With the proliferation of virtualization, a new network access layer is emerging that provides inter- and intraVM connectivity and is evolving many of the same functions provided by the physical layer. Even today, this layer is providing connectivity to tens of VMs per physical server.

While virtualization's impact on computing is well known, its implications for networking are far less explored. In particular, virtualization imposes requirements on network

mobility, scaling, and isolation that are farm beyond what is required in most physical deployments. Seamless handling of mobility is a necessity, since VMs can freely migrate between hosts and scaling limits are tested because data centers can support hundreds of thousands of VMs. Strong isolation is required in joint-tenant environments where tenants share the same physical infrastructure.

While imposing more stringent requirements, virtualization also provides features making networking easier. For example, in virtualized environments, the virtualization layer can provide information about host arrivals and movements. Similarly, multicast membership can be inferred through introspection within the virtualization layer. The topology also becomes more tractable because networking at the virtualization layer is composed entirely of leaf nodes.

On one hand, server and storage virtualization achieves greater success in term of efficiency and performance. On the other hand, network virtualization research has slower innovation. This is due to data flow in traditional network is controlled by switches and routers. Since the control plane software is normally proprietary, network administrators have very little opportunity to increase data flow efficiency across the network as a whole. However, Software - Defined Networking is changing the way we configure and manage networks.

In Malaysia, Cloud Computing investments is expected to reach RM2.8bil by 2020, a significant rise from the RM140mil recorded in 2012. On a global scale, spending on cloud computing services is expected to grow to RM509 billion by 2020, according to a Forrester Research Forecast (The Star, 2014).

Multimedia Development Corporation (MDEC) chief executive officer Datuk Badlisham Ghazali said cloud computing was a focus area on Malaysia's ICT Roadmap, having created 3,000 jobs in 2012. Moving forward, he said, MDEC realises the value and potential of cloud computing and has worked with ICT industry players, stakeholders and other government agencies in driving its revolution in Malaysia (The Star, 2014).