Evaluation of Virtual Desktop Infrastructure Host using User Workload Simulator

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***Abstract*—Increasing cost and complexity of maintaining physical computers have caused large organization to consider alternative solution such as implementing Virtual Desktop Infrastructure (VDI) in their enterprise network. However, before deploying VDI solution in a large scale, it is essential to evaluate the sufficiency of the solution first. As a result, User Workload Simulator was developed. The simulator was used to evaluate two VDI solutions that are named VDI A and VDI B. The objective of the evaluation is to compare which solution can be a better VDI server host. From the result, VDI A is sufficiently better than VDI B for VM density per host. But in terms of network bandwidth utilization and Input/Output Operations Per Second (IOPS) consumption per host, VDI B is sufficiently better as it utilized less network bandwidth and consumed less IOPS on most of the user profiles evaluated.**

Keywords— IOPS; load testing; network bandwidth; performance monitoring; virtual desktop infrastructure; virtual machine;

I. INTRODUCTION

Virtual Desktop Infrastructure (VDI) is the practice of hosting several desktop operating system within Virtual Machines (VMs) running on a centralized server that is known as VDI server host [1]. By using VDI, large organization such as university can carry out a policy of "Bring Your Own Device" (BYOD) in their enterprise network, i.e. allowing students and staffs to bring their own gadget to the campus.

Accessing the VDI is simply by using a virtual desktop which is an individual user's interface in the virtualized environment [1]. The user is able to get an access by logging into the virtual desktop remotely as long as their gadget can connect to the VDI server host which is usually located at a centralized data center of the university.

Using VDI, students and staffs can work freely from anywhere in the university and able to access privileged information or licensed application software (i.e. provided by the university). Often the application will be running directly from the VDI server host. At the same time, the risk of data theft can be minimized as sensitive information is stored on the server in the data center and not on the user's device. If the device is stolen, the information is still well protected [2].

Increasing cost and complexity of maintaining physical computers have caused large organization to consider implementing VDI in their enterprise network [2]. In the past, without VDI, each physical computer need to be maintained individually. However, with VDI, only the centralized server's hardware and software will be upgraded if the system need to be expanded.

Besides, with VDI implementation, a Virtual Machine (VM) that resides inside the server can be easily moved to another server (i.e. without shutting down any services). As a result, the downtime of services such as Remote Desktop Services (RDS), web hosting service or FTP hosting can be reduced substantively. All the services can be kept running in another server, while the original server is in a maintenance mode.

However, before deploying VDI solution in a large scale, it is essential to evaluate the sufficiency of the solution first. The criteria of sufficiency of VDI host is often determined by its maximum density of VM per host. After the value of maximum VM density per host is determined, other parameters like network bandwidth and Input Output Operation per Second (IOPS) of the host will also be calculated. It is important to examine the network bandwidth and IOPS because these factors will determine the end user experience and satisfaction while using the VDI [3].

Fig. 1 showed the integration of compute, network and storage in a VDI environment. In VDI environment, compute, network and storage are integrated as one infrastructure. This is another reason why evaluation of network bandwidth and IOPS of the storage together with VM density per host are needed.

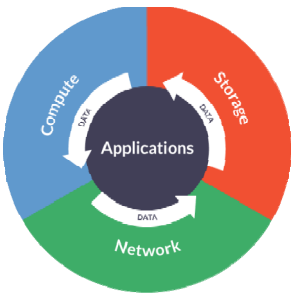

Fig. 1. Integration of compute, storage and network as one infrastructure.

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