

Cost Effective Sustainable Private Cloud

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ABSTRACT

The project was to research and implement an Infrastructure as a Service (IAAS) cloud solution for teaching purposes at the EIT Auckland Campus under the supervision of Emre Erturk and at the request of the Assistant Head of School David Skelton (as the sponsor). The project was to give an alternative solution for the virtual environments that students use for papers and also to provide an IAAS cloud. The project does not use server grade technology which has caused some issues during the implementation of the system. As it is a more a proof of concept the School of Computing would have to invest in server grade hardware for a much larger user base. The outcome is a system the students can use from home and onsite. William Hannon continues to support the current system and looks forward to expanding the cloud to more users.

Keywords: cloud computing, open source, IaaS

1. INTRODUCTION

The Auckland campus has limited hardware resources available for teaching. The computer rooms are managed by the Computer Services department in Taradale who lock down the operating systems limiting their use. The Cloudstack IAAS server will allow students to create virtual machines for use in the School of Computing papers without restrictions. It will allow the students to get access to their work off campus



2. CHOOSING A SOLUTION

The sponsor wanted an open source solution as their budget is limited and wanted to avoid unnecessary on going costs like subscription based plans. Increasing IaaS adoption is not unusual for EIT; it is expected in the near future cross the industry (Erturk, 2017). The technician identified the following IAAS solutions:

- Cloudstack
- Eucalyptus
- Openstack
- OpenNebula

These solutions were tested and evaluated. Cloudstack was chosen as the desired platform for the project.

3. IMPLEMENTATION

A Windows Server 2012 R2 server was installed with Hyper-V Role. On this server the Cloudstack Management server and a Windows 2012 R2 VM hosted DHCP, DNS and PXE services for the cloud. Centos 7 was installed on a separate computer with SSD's to be used as the storage server. The remaining of the computers were used as nodes and these had XenServer 7.0 installed. All the computers were connected to a AT8000GS gigabit switch. The switch was connected to a Sophos firewall for internet and VPN access.

4. USER GUIDE – MINI PROJECT

The guide for end users has detailed step by step instructions with screenshots visually detailing how to create a virtual machine instance from a template or ISO and enable external internet access. This professional user guide is an evidence of the potential academic rigour of internships (Skelton, 2016). The guide included the steps for connecting to the VPN, changing passwords and remote accessing their instances.

5. CONCLUSION

During the implementation stage, time and mental energy was required to setup the system in a stable state. With more nodes added, the virtual environment can be used by more staff and students. Support for multiple hypervisors in Cloudstack gives options, if one may cease to function or become unaffordable. As discovered, not all of them function equally. XenServer seems to be the most robust free hypervisor for Cloudstack. Overall, this system is functioning well, and will turn into a great educational resource for the School of Computing.

6. REFERENCES

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