DESIGN AND IMPLEMENTATION CLOUD COMPUTING AT ILP SELANDAR

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OPEN UNIVERSITY MALAYSIA

2014

DESIGN AND IMPLEMENTATION CLOUD COMPUTING AT ILP SELANDAR

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A Master's Project submitted in fulfillment of the requirement for the degree of Master of Information Technology in Networking Computing

Centre for Graduate Studies

Open University Malaysia

2014

DECLARATION

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I hereby declare that this Master's Project is the result of my own work, except for quotations and summaries, which have been duly acknowledged.

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January 2014

ABSTRACT

Cloud computing is a new technology can be described as the next generation of Information Technology for the educational technical institute in Malaysia. With the rapidly growing needs of the information technology and the current financial crisis, most of the higher education institutes including the technical institute are facing the problem to provide the ICT infrastructure, education and development activities. However, cloud computing implementation in a technical institute in Malaysia is in the beginning stage. This research aim is to design and implement of Cloud Computing at ILP Selandar in learning and teaching environment also to allow the management, reducing the cost to purchase the expensive computer, licensed software and program that using during the learning process. This research also proposed to deploy a Hybrid Cloud Computing model where is the combination of existing local infrastructure with the public Cloud. The information is gathered by the interviewing IT Team and senior lecturer, they recommend the implementation of Cloud Computing at ILP Selandar.

Keywords: Cloud Computing, Hybrid Cloud Computing, Technical Education Institute

REKABENTUK DAN PERLAKSANAAN PENGKOMPUTERAN AWAN DI ILP SELANDAR

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Januari 2014

ABSTRAK

Pengkomputeran awan adalah merupakan satu teknologi baru yang boleh digambarkan sebagai Teknologi Maklumat bagi generasi akan datang di institusi pendidikan teknikal di Malaysia. Dengan berlakunya krisis kewangan semasa, menyebabkan kebanyakan institusi pendidikan tinggi termasuk institut teknikal menghadapi masalah dalam penyediaan infrastruktur ICT dan aktiviti pembangunan pendidikan. Walau bagimanapun pelaksanaan pengkomputeran awan di institut teknikal di Malaysia masih di peringkat awal. Tujuan penyelidikan ini adalah untuk mereka bentuk dan melaksanakan pengkomputeran awan di ILP Selandar dalam pembelajaran dan pengajaran sekali gus dapat mengurangkan kos dalam pembelian komputer, perisian berlesan dan program yang digunakan semasa proses pembelajaran. Model Awan Hibrid dicadangankan dalam melaksanakan pengkomputeran awan, di mana ia adalah gabungan infastruktur sedia ada dengan awan awam. Pegawai Teknologi Maklumat dan Pensyarah Kanan yang ditemubual telah bersetuju untuk mencadangkan pelaksanaan Pengkomputeran Awan di ILP Selandar.

Kata Kunci: Pengkomputeran Awan, Model Awan Hibrid, Institut Pendidikan Teknikal

ACKNOWLEDGEMENT

In the name of Allah, the Most Gracious and The Most Merciful Alhamdulilah, all praises to Allah for the strength and His blessing in completing this thesis. Special appreciation to my supervisor Dr Thinagaran Perumal, for his supervision and constant support. His invaluable help of constructive comments and suggestion have contributed to the success of this thesis.

Sincere thanks to all my friends, especially Sarmila Marimuthu for other kindness and moral support during completing this thesis. Thanks for the friendship and memories.

Last but not least, my deepest gratitude goes to my beloved mother Pn. Oshmah Binti Mohd Noh and also my sisters and brothers for their endless love, prayers and encouragement. To those who indirectly contributed to this research, your kindness means a lot to me. Thank you very much.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

In the recent year the Green ICT and cloud computing concepts become a popular in the computer information technology industry. Most of the IT companies have been working and investing in the Green ICT and cloud computing developing because of the high demand and greater competition in the innovation of the IT Industry. Many managers in a small business and the academician in universities and higher technical institution want to implement the Green ICT and cloud computing to meet their needs and requirement. The IT companies such as IBM, Google and Cisco are encouraging the education to adopt the cloud computing at their universities and institution. For example Google Apps has designed for the educational usage and IBM launched their Cloud Academy and provide the forum for the educator, researcher and IT professional to improved and develop their skill in the cloud computing.

The implementation of the cloud computing has brought the new changing in the quality of learning and teaching by providing access to the learning and teaching material.

Institut LatihanPerindustrian Selandar (ILP) like other higher technical institute, want to implementing and using the cloud computing services in their learning and teaching environment. Using the cloud computing at ILP Selandar will allow the management reducing the cost for purchase the expensive computer, licensed software and programs that using during the learning processes.

Technical Institute like ILP Selandar, can take the advantage of cloud to provide the student and lecturer with low cost alternative to the higher cost, proprietary productivity tools and other. The browser based application is also compatible with variety of computer and mobile platform and making all this tools available anywhere that internet can be access.

The cloud computing players in these fields are Google, Microsoft, Amazon, IBM, Sun, Dell and Cisco where offer the new computing technologies, infrastructure and resources such as application, storage, communication and other. Using the education cloud as the software, infrastructure and data platform over the Internet Green Information and Communication technology is widely understood as a prelude to convince individuals, groups and organization to involve in the of ICT to consider environmental problems and find the solution. Using ICT in the education is one of the causes of carbon dioxide emission, high energy usage and unsafe waste management. Green computing policies and practice can adopt at ILP Selandar to reduce the use of hazardous material, minimize the energy consumption, ICT waste, and so that the energy cost can be reduced.

1.2 Definitions of Cloud Computing

Cloud computing can be described both a platform and type of application. A cloud computing platform a dynamic allocation, configures, reconfigure and provisions server as needed. In cloud computing, servers can be a physical or virtual machine. The advanced cloud usually includes computing resources like storage area network (SAN), network devices, firewall and other security devices. Cloud computing also can be describes application that's available to be accessed via the internet. Cloud applications using a large data center and a high performance server that host the Web application and Web services.

National Institute of Standards and Technology (NIST) define cloud computing as a pool of computing resources such as servers, networks, services and application that provide convenience, flexibility and more performance on demand of network access which is consist of five characteristics, where are three service models and four deployment models. Three service models are Cloud Software as a Service (SaaS), Cloud Platform as a Service (PaaS) and Cloud Infrastructure as a Service (IaaS). Software a Service (SaaS) is where application is hosted and delivers online via the web browser. Cloud Platform as a Service (PaaS) where the cloud provide the software platform for the system and Infrastructure as a Service (IaaS) is a set of virtualized computing resources. The four cloud deployment models are Public Cloud, Community Cloud, Private Cloud and Hybrid Cloud.

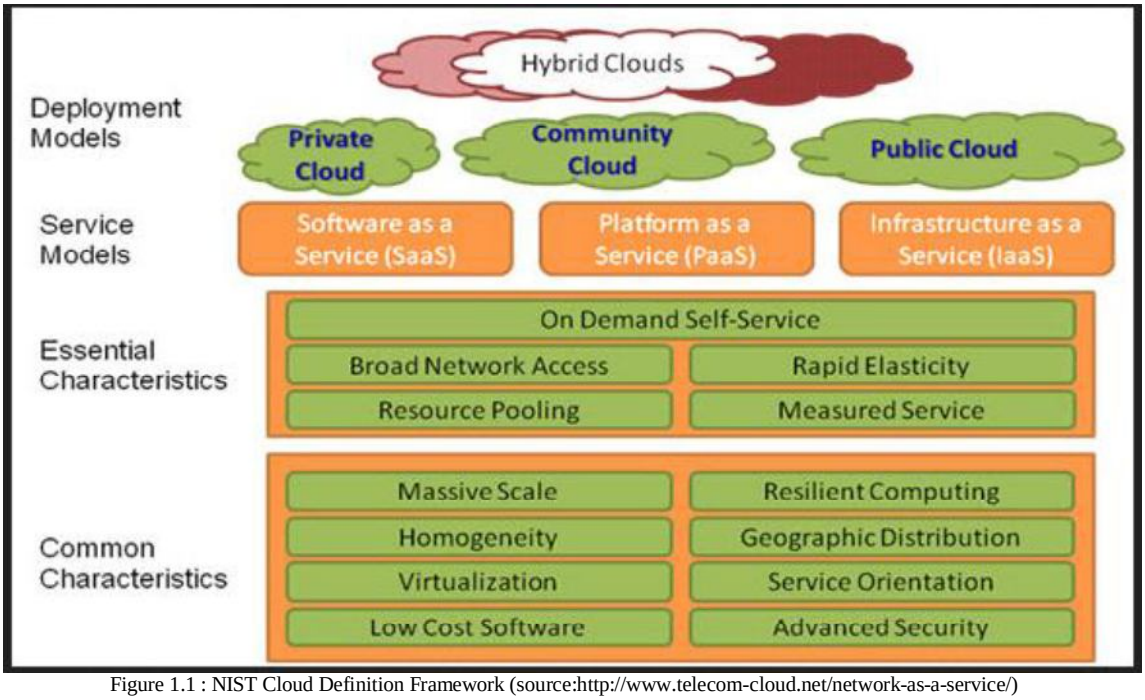

Figure 1.1 : NIST Cloud Definition Framework (source:http://www.telecom-cloud.net/network-as-a-service/)

According to the standard definition that be given by NIST, the cloud computing goal to make a better use of distributing resources and combine of both to achieve higher throughput as well as to be able to solve large scale computation problems.

1.3 Problem statement

Every year ILP Selandar need to facing the financial challenge of providing the ICT infrastructure such as purchasing licensed software and expensive computer with bulk of memory and disk including the programs, to support teaching and learning activities. Using the cloud computing technology can help ILP Selandar to reduce the expenses of purchasing ICT infrastructure.

Currently the teaching and learning material such as lesson plan, information sheet, worksheet and assignment sheet are installed on the lecturer's computer. With cloud computing application the lecturers and students do not have to bring their documents and data, otherwise they will able to access the resources and materials in the cloud and where from any connected devices. Therefore, in this work, we proposed to implement cloud computing technology as one stop solution for ILP Selandar.

1.4 Research Objective

The objective of this research is follow:

i. To study the benefit of cloud computing for ILP Selandar
ii. To cut down ICT infrastructure cost for ILP Selandar
iii. To design cloud computing architecture for ILP Selandar

1.5 Research Scope

This research is guided and limited by the following scope of research:

i. This scope of research is limited to ILP Selandar, so that the research is focused to design and implementation green cloud computing at ILP Selandar.
ii. Identify the benefit of green cloud computing implementation at ILP Selandar.

1.6 Summary

Summary of the dissertation of organization is showed below:

Chapter 2: Discuss the literature review related for this research. It include the concepts of Cloud Computing in education field, cloud service model, cloud deployment model and the popular cloud service provider player for education. The benefit opportunity of cloud computing also discussed in this chapter.

Chapter 3: This chapter present the methodology for design and implementation cloud computing at ILP Selandar. The discussion of design and what design is selected for ILP Selandar and sample of cloud services can be provided with the proposed Cloud Computing framework. Framework of architecture are discuss in detail in this chapter. It also contain the implementation proposal for the proposed Cloud Computing framework.

Chapter 4: This chapter contain the information that provided by the IT Team and Senior Lecturer and it is presented using the bar chart and pie chart. The questionnaire result has been analyzed and the summary of key finding is presented.

Chapter 5:This chapter is discuss the conclusion of the research, recommendation future work and the contribution of the research.

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