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Survey On Hybrid Cloud Computing and Service Provider

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Abstract - Cloud Computing is quickly emerging as a promising paradigm in the recent years especially for the business sector. In addition, through cloud service providers, cloud computing is widely used by Information Technology (IT) based startup company to grow their business. However, the level of most businesses awareness on data security issues is low, since some Cloud Service Provider (CSP) could decrypt their data. Hybrid Cloud Deployment Model (HCDM) has characteristic as open source, which is one of secure cloud computing model, thus HCDM may solve data security issues. The objective of this study is to design, deploy and evaluate a HCDM as Infrastructure as a Service (IaaS). In the implementation process, Metal as a Service (MAAS) engine was used as a base to build an actual server and node. Followed by installing the vsftpd application, which serves as FTP server. In comparison with HCDM, public cloud was adopted through public cloud interface. As a result, the design and deployment of HCDM was conducted successfully, instead of having good security, HCDM able to transfer data faster than public cloud significantly. To the best of our knowledge, Hybrid Cloud Deployment model is one of secure cloud computing model due to its characteristic as open source. Furthermore, this study will serve as a base for future studies about Hybrid Cloud Deployment model which may relevant for solving big security issues of IT-based startup companies especially in Indonesia.

Key Words: Cloud Computing, Hybrid Cloud, Data Centre, start-up, MAAS, IaaS

1. INTRODUCTION

In Today's world, innovation is developing at a quick pace and offers the client with various services which are paperless and accessible online, for example, e-charging, email, emessage, e-transaction and so forth. All these accessible administrations require an online information exchange. Atta urRehman Khan etal[1] has discussed on these information that might be any private or delicate data like business secret information, MasterCard detail, managing an account exchange and so on, which require more assurance as disclosure of these secret information of any unapproved client may be unsafe. The greatest advancement in the field of computing is capacity and access of information in the cloud, be that as it may, there are numerous things that need to take think about as well. Many creators disclose that cloud computing has a few advantages when contrasted with their drawbacks. Yet, this found that as association of information builds, security of information becomes into a huge issue in spite of the fact that we have to discover a way all you require with a specific administration. Cloud computing has been rising up out of the latest advances in innovation, for example, hardware Virtualization and distributed computing. The refinement with cloud computing is that the processing methodology may continue running on one or many related PCs meanwhile, utilizing the possibility of virtualization. The advantages and disadvantages of cloud computing are described in Fig.1.The cloud model is made out of six of cloud computing fundamental qualities, three service models and four deployment models. Cloud gives different service models as, IaaS, PaaS, and SaaS. It can be sent at various deployment models, i.e. at public, private, hybrid and community cloud.

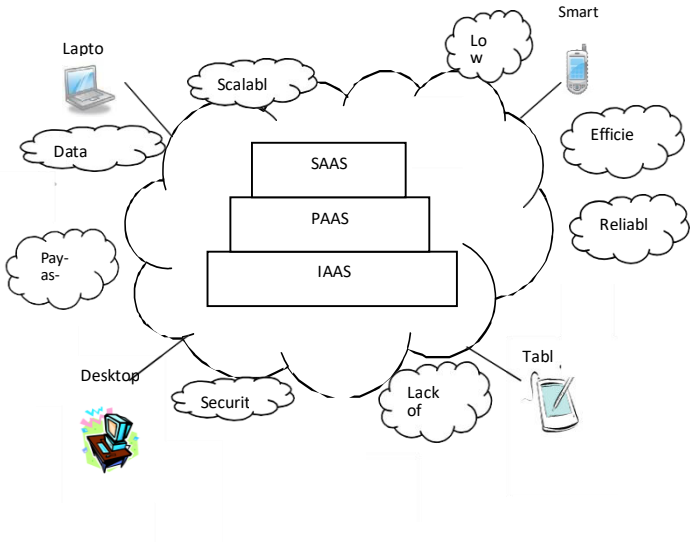

Fig 1: Overview of Cloud computing

2. THEORITICAL BACKGROUND

2.1 CLOUD COMPUTING

HCDM is one of cloud computing model, which is included combination of the use of computer technology in a network with the development of computer-based network or the Internet (cloud). It has a function to run applications through interconnected computer at the same time [5]. The way of cloud computing works is that users can access files, data, programs and services on an internet browser via the internet. Pay per use services and computing resources are the main advantage of cloud computing [6]. Cloud computing use three pieces of unification technology, namely Data Center, Virtualization and Utility/On-Demand Computing [7]. Data Center is the center of computing, storage and applications. Virtualization is a technology that enable an IT infrastructure

to operate like some IT infrastructure, thus may minimize the organization's CapEx and OpEx [2-7]. Whereas, Utility Computing is a service delivery model that provides computing services according to customer needs, it attracts no cost at a fixed price but in accordance with its use [8]. There are four deployment models, such as Private, Public, Community and Hybrid Cloud. Some of the available Cloud Computing service models are Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS) [6-10], and even X as a Service (XaaS) where X can be any services [2]. In addition, the implementation of cloud computing on some companies have big security issues. Table 1 below reveals comparison of cloud computing based on deployment models [14][15].

Deployment models	Holder	Security	Scalability	Cost
Private Cloud	Single private organization	Higher than other deployment model	Limited	High
Community Cloud	Two or more private organizations with identical requirements	Lower than Private Cloud and higher than Public and Hybrid Cloud	Limited	medium
Public Cloud	Cloud Service Provider (CSP)	Lower than other deployment models	Very High	Pay-per-use
Hybrid Cloud	CSP and private organizations	Lower than Private and Community Cloud and higher than Public Cloud	High	Pay-per-use

Table -1: Comparison Of Cloud Deployment model

Research community have made numerous studies related to cloud computing. Two studies about deployment method of Private Cloud have been conducted, the result revealed that deployment method of Private Cloud using Eucalyptus and OpenStack had been deployed successfully [17][18]. Our paper extend these results related to the security and performance issues of Private Cloud versus Public Cloud.

2.2 Cloud Computing Security

Nowadays, the data transfer trend outside of a controlled environment is one of big security issues. P. Rajendran, et al [10] has proposed and implemented intrusion detection system for private cloud using Microsoft Azure, which is a public cloud. The result shows those proposed model is less efficient when implemented properly in public cloud.

3. Different Deployment Model:

3.1 Public Cloud

It is the genuine portrayal of cloud hosting where the client and provider have a strong Service Level Agreement (SLA) to maintain the trust between them. Saurabh Singh et.al[5] has proposed a cloud framework, which provides open access to the public and the organization. Businesses, scholastics, or governmental associations possess a public cloud environment. A public cloud is run and managed by the Cloud Service Provider (CSP) and the physical foundation may introduced at off-site location of the client.Hence numerous elements may claim and work in a public cloud. This makes many issues, as it is unaware of where the resources are found or who claims them, expanding the trouble of protecting them from attack. Sahandi Reza et.al[11]has stated a public cloud computing as when a service provider makes a service or an application available to be used to people around the world over the world wide web and providing service to multiple organizations at a time by making use of the pay per usage system for payment of the service provided .

3.2 Private Cloud

Cloud computing works and manages inside the data center of an association are known as a private cloud. Numerous buyers of cloud infrastructure (e.g., business units) are including arrangement for elite use by a single association. Clearly W et.al[10]has stated that a Private cloud is like a general public cloud, however, they are scalable and self-servicing through an appropriate structure and it delivers the service of a single association. In a private cloud, it is significantly less demanding to recognize the client and provider relationship on the grounds that the foundation possessed and worked with a similar association. In this way, security dangers are less demanding to recognize.

3.3 Community Cloud

Chirag Modi et.al [9] has discussed about community cloud. A cloud that is deployed and shared among a group of people for sharing common interest, such as mission, security policy, application and services is known as community cloud. It is owned, and managed by community organizations, an outsider, or some mix of them driven by one or many, and that might be available on or off campus Saurabh Singh et.al[5]. In simple words, a community cloud is being shared and controlled by various organizations. It additionally reduces the security chance in the public cloud and reduces the cost of private clouds.

3.4 Virtual Private Cloud

Rahul Khurana1 et.al [7] has stated a virtual private cloud as a semi-private cloud, which uses fewer resources, and it consists of Virtual Private Network (VPN). It is a demand configurable pool of shared resources allocated within the cloud environment.

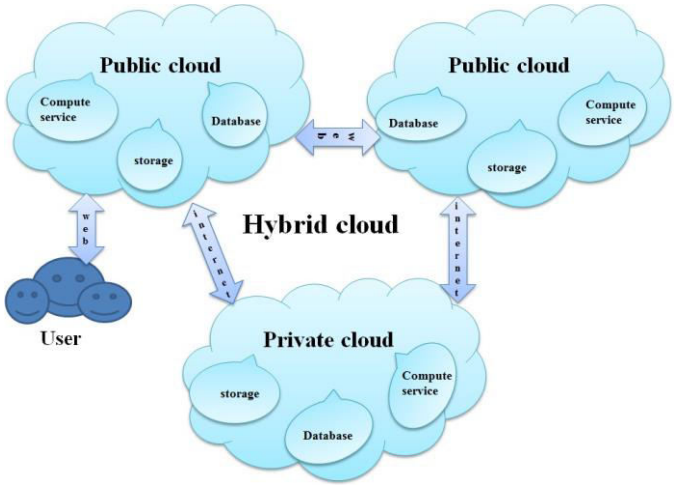

Fig 2: Hybrid Cloud Services Model

3. CONCLUSIONS

In this study, the design and deployment of HCDM were conducted successfully. In order to evaluate HCDM, we have performed preliminary of security and data transfer speed analysis. In comparison with Public Cloud, that have a QUIC Protocol and is within Public IP Address range, we found that HCDM have a SSH protocol and is within Private IP Address range, it could be concluded HCDM has more secure connection. Furthermore, we analyze data transfer speed between client to HCDM and client to public cloud. Notably, HCDM is able to perform data transfer speed of 100 times higher than public cloud. To the best of our knowledge, this finding enhance our knowledge of cloud computing. It may serve as a base for future studies about Hybrid Cloud Deployment model which may relevant for solving big security issues of IT-based startup companies especially in Indonesia.

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