Cloud Computing + Digital Forensic + Business = Cloud Forensic for Business (An Overview)

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Abstract

In this modern era,both consumers and traders have to understand about IT in order to know the market situation. A company will use a tool of technologies such as cloud computing. Meanwhile,the cyber crime is followed the trend,therefore digital forensic is needed. There are many researchs discuss about cloud computing, digital forensic, and cloud forensic. Cloud forensic enable to monitor the cloud for identification evidence of a crime or theft of data on the cloud. This research will discuss the new objective that is cloud forensic from business point of view.

Keywords : *Cloud Computing, Digital Forensic, Business, Cloud Forensic for Business*

1 INTRODUCTION

Today is the eras of transformation that are digital and mobile transformation which makes information are easily to be known than before. Therefore, consumers tend to change their need to the social media. It makes changing of the consumers point of view on prominent necessity.

Cloud gives a method to company in order to use this digital trend benefit to fulfill the consumers need and to boost the future development. Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model is composed of five essential characteristics, three service models, and four deployment models.

According to Network World [1], Any business that anticipates using cloud-based services should be asking the question: What can my cloud provider do for me in terms of providing digital forensics data in the event of any legal dispute, civil or criminal case, cyber attack, or data breach?

The development of cloud computing is followed by the cyber crime. The criminals easily escape from the fraud so that there is no proof. That is the reason digital forensic is to be
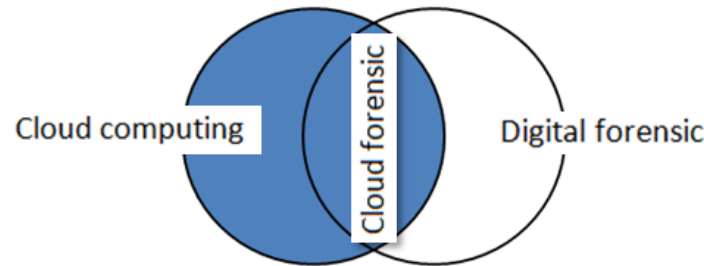
Figure 1: Cloud forensic

found. Digital forensic is a method to find out the criminal in cyber world. According to [2] digital forensic divided in to some branches that are computer forensic, network forensic, software forensic and live system forensic. Meanwhile, in this journal, it is going to discuss about computer forensic. Computer forensic divided into hard disk , removable media acquisition and analysis.

There are some information that can be gotten while doing computer forensic, that are date and time, place and location of the incident, evidence from volatile system and nonvolatile system, details of the person(s) for the incidents, name and identification of the person who can serve as potential witness.

The objectives of this research are discussing the combination between cloud computing science and digital forensic implemented on business sector.

2   CLOUD COMPUTING

Cloud computing [3] is a pay-per-use consumption and delivery model that enables real-time delivery of configurable computing resources (for example, networks, servers, storage, applications, services). Typically, these are highly scalable resources delivered over the Internet to multiple companies, which pay only for what they use. Cloud computing artifacts left by the usage of the most popular Cloud Storage services on personal computers and mobile devices are dropbox, google drive, skydrive and icloud. Eppifani [4] Dropbox arose in 2007 and in 2012 there was 100 millions users. The capacity is 2 GB. Google drive born in 2012 and on May 2013, there was around 425 millions users. The capacity is around 15 GB available space for free. Skydrive born in 2007 and on May 2013 there was 250 millions users. The capacity is 7 GB available space for free. Icloud using itunes we can make a backup of an iOS device.

Essential Characteristics for cloud computing [5] :

1. On-demand self-service. Network saving, automatically can save without interacting with the users.

2. Broad network access. The ability using network and can be accessed by standard mechanism.

3. Resource pooling. Resource pooling is used for consumers who used multy-renting model.

4. Rapid elasticity. The ability can be stated and applied, in certain cases it is automatically. For the consumers, the capacity is unlimited and can be arranged according to the amount in every occasion.

5. Measured service. System Cloud automatically control are sources by metering capability accordance with the services (for instance, saving, processor, bandwidth, and active account). The user can be controlled, reported, to give transparency for the consumers and vendors.

Service model [5] dari cloud computing consist of:

1. Software as a Service (SaaS). The ability for consumers to use this application of cloud infrastructure.

2. Platform as a Service (PaaS). The ability for consumers to use application for programming, library, services which is supported by the provider.

3. Infrastructure as a Service (IaaS). The ability for consumers to processing, saving, networking, and another basic computing, in which consumers can spread and do the software, this is including operational system and application.

There are many types of cloud, depending on the need as a home user or small business owner [6], among others:

1. Public Cloud - A public cloud can be accessed by any subscriber with an internet connection and access to the cloud space.

2. Private Cloud - A private cloud is established for a specific group or organization and limits access to just that group.

3. Community Cloud - A community cloud is shared among two or more organizations that have similar cloud requirements.

4. Hybrid Cloud - A hybrid cloud is essentially a combination of at least two clouds, where the clouds included are a mixture of public, private, or community.

3   DIGITAL FORENSIC

Digital Forensics[5] is the use of scientifically derived and proven methods toward the preservation, collection, validation, identification, analysis, interpretation, documentation, and preservation of digital evidence derived from digital sources for the purpose of facilitating or furthering the reconstruction of events found to be criminal, or helping to anticipate unauthorized actions shown to be disruptive to planned operations.

Digital forensic has some brances of science such as computer science, network forensic,etc. The forensic term was well known since 2009 in Indonesia. When investigating by this method, the researcher needs to apply 5W+1H (What,where,why,when,who+how). After all of the answer are accomplished, the forensic report could be done.
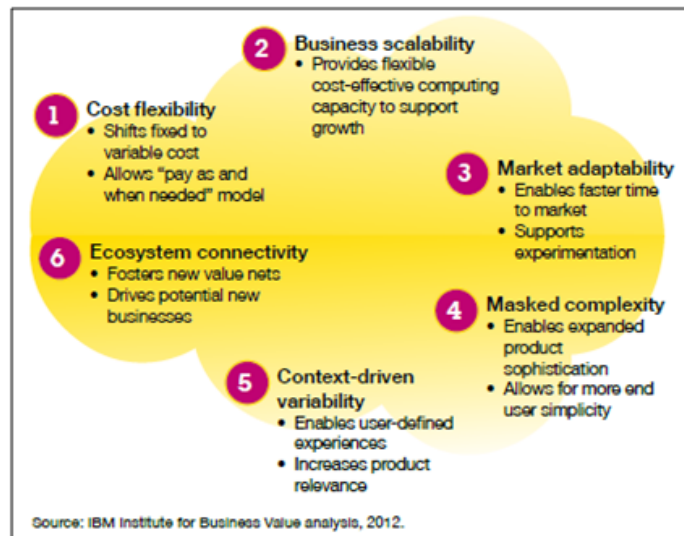
Figure 2: Cloud business enablers [3]

4   DISCUSSION

The author tried to combine some branches of study, that are cloud computing as the bigger saving tools for company and digital forensic, an investigating method to find out the cybercrime so the fraud cannot escape from the criminal. The theory is that in combination with a digital forensic cloud computing is generating theory that is cloud forensic so that it can be applied in business.

4.1   Cloud for forensic

In the previous research, there was a discussion about cloud forensic, that is the combination between cloud computing and digital forensic, however there is not much research which discuss cloud forensic in business. There was also discussion about cloud computing from the business point of view, but there was not much discussion in forensic part. (see fig. 1.)

Cloud forensics is the application of digital forensic science in cloud computing environments. Technically, it consists of a hybrid forensic approach (e.g., remote, virtual, network, live, large-scale, thin-client, thick-client) towards the generation of digital evidence. Organizationally it involves interactions among cloud actors (i.e., cloud provider, cloud consumer, cloud broker, cloud carrier, cloud auditor) for the purpose of facilitating both internal and external investigations.

When acquiring digital artifacts in the cloud, whether for preservation, presentation in a court of law, or the internal investigation of employees misuse, basic forensic principles and processes apply. The forensic process is broken into four distinct steps[8]:

1. Collection: artifacts (both digital evidence and supporting material) that are considered of potential value are collected.

2. Preservation: preservation of original artifacts in a way that is reliable, complete,
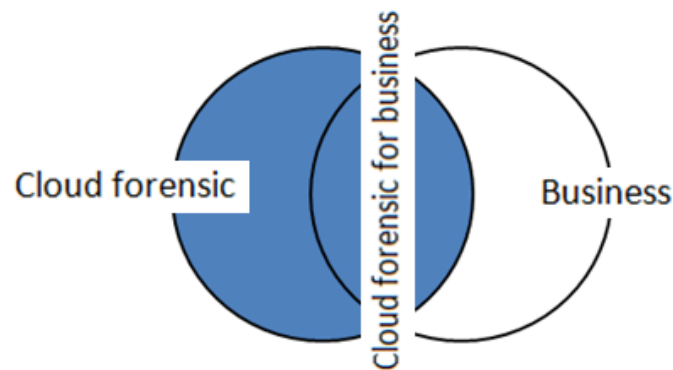
Figure 3: Cloud forensic for business

accurate, and verifiable.

3. Filtering: analysis of artifacts for the removal or inclusion of items that are considered of value.

4. Presentation: step in which evidence is presented to support investigation.

Issue appeared on cloud forensic [9] are problem of data security, the authentication is lacking, and data integrity.

4.2 Cloud for Business

There are six clouds [3] which can be used as power business model innovation, called business enablers: Cost flexibility, business scalability, market adaptability, masked complexity, context driven variability and ecosystem connectivity (Fig. 2.). The description of the fig. 1. about cloud computing for business [3]:

1. Cost flexibility. Cloud helps the organization to decrease the technology information cost by changing the financial capital cost as operational cost. Usually, the cost of technology information includes enterprise software license, server and network tools; it is not easy to predict the cost of information technology. Using cloud application, there is no need to build hardware, to install software or to pay the cost of particular software license. By adopting cloud, organization can change the financial capital cost as operational cost. Organization only needs to pay what the company needs. Pay-per-use model gives the bigger flexibility and omit the need of expenditure significantly.

2. Business scalability. There are many people claim that IT scalability is the main benefit of adopting cloud. However, cloud promotes more than IT scalability- which gives more scale of business operational. By giving unlimited chance of resource, cloud gives the company opportunity to get economy scale without has to reach the big volume of target.

3. Masked complexity. There is another benefit of cloud: masking complexity. Cloud gives a method to conceal their last operational activity so it can attract bigger consumers.

4. Context-driven variability. Context-driven variability which is given by the cloud gives the company could offer the user personal life experience, which is called user defined , this method gives the possibility the user to user- centric way.

5. Ecosystem conectivity. Cloud facilitates collaboration between consumers and companies. This method gives significantly rise of productivity and innovation. Cloud Platform combines between people, resources, information and process. Health Hiway is the example of cloud in activating the ecosystem connectivity.

Researchers present a new view of the combination of cloud, forensic and business (see fig. 3.), because most users of cloud computing an organization, both large and medium scale. In most organizations are using public cloud scale. Public cloud [8] is a public cloud can be accessed by any subscriber with an internet connection and access to the cloud space. Whereas the large-scale organization using a hybrid cloud. Some of associated with the implementation of cloud are exceptional bandwidth, storage and computing power [10].

5 CONCLUSION

There are many research and articles which discuss about cloud computing, besides discussing about digital forensic and cloud forensic. Therefore, the author wants to introduce new model of research that is cloud forensic for business. This paper is just an introduction of a science.

In the future research are expected to further research on methods used for cloud forensic especially in areas of business, characteristics of cloud forensic for business so that the organization can increase the benefits and security issues in the cloud could be better.

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