REVIEW ARTICLE

A STUDY ON THREATS AND ADVANTAGES IN CLOUD COMPUTING

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ARTICLE INFO	ABSTRACT
	The need for reduction in infrastructure cost and to implement shared services has given rise to enthrone cloud computing in various field. Along with the boons of cloud computing the number of threats on the security of information store in shared mode is high. The most discussed issues in cloud computing is security: still the benefits on cloud computing usage is dominant. Here in our paper we have performed a complete and detailed study on various threats impended while using cloud computing resources and the advantages of using cloud computing

INTRODUCTION

In General cloud computing services are acronym by SPI (Mell and Grance, 2009). This acronym stands for the three major services provided through the cloud: software-as-a-service (SaaS), platform-as-a-service (PaaS), and infrastructure-as-a-service (IaaS).

The organization of the paper is given below.

- Section 2 – Cloud Formations
- Section 3 - Threats in Cloud Computing
- Section 4 - Cloud Deployment Models
- Section 5 - Advantages of Cloud Computing
- Section 6 - Evolution of Cloud Computing
- Section 7 – Conclusions

Cloud Formations

The cloud environment has been mainly subdivided into public, private, hybrid and community clouds. Based upon these types only the cloud formations can be done. On the users request are the level of using the cloud service will make the users to decide which mode of cloud environment suits them.

Public clouds

A public cloud is one in which the infrastructure and other computational resources that it comprises are made available to the general public over the Internet. It is owned by a cloud provider selling cloud services and by definition, is external to an organization.

Private cloud

A private cloud a proprietary network or a data center that supplies hosted services to a limited number of people (http://en.wikipedia.org/wiki/Cloud_computing) (Armbrust *et al.,* 2009). It may be managed either by the organization or a third party, and may be hosted within the organization's data center or outside of it.

Hybrid cloud

A hybrid cloud is a composition of two or more clouds (private, community, or public) that remain unique entities but are bound together by standardized or proprietary technology that enables interoperability.

Community cloud

A community cloud is somewhat similar to a private cloud, but the infrastructure and computational resources are shared by several organizations that have common privacy, security, and regulatory considerations, rather than for the exclusive use of a single organization. From greater security and privacy, which may be important for policy reasons.

Threats in cloud computing

Shared Technology

In cloud computing, the services are given wide open to all the users. A single cloud storage was shared between other cloud

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account holders (User Survey Analysis, 2009). So there is a possibility use other uses data are license to run their own cloud account. In order to reduce this problem priority level should be maintained. Administrative privileged users should monitor the account in same cloud networks.
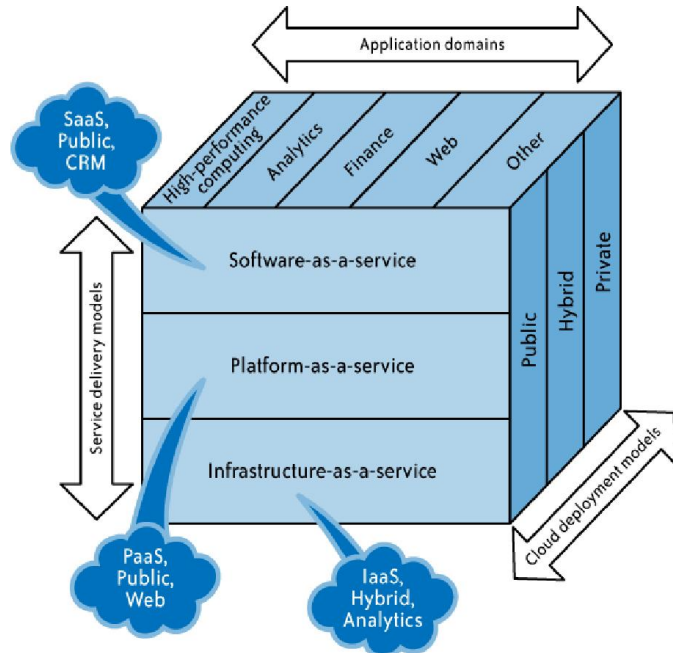

Fig.1.1 Cloud computing Service model (Tm mather *et al*., ?)

Abuse

The process of creating cloud account in a public network is simple process. So many hackers are trying to create cloud account and then they are trying to attack the cloud server like DDoS attacks. So, they process of creating private or the public cloud and adding the clients should be strictly monitored to avoid the problems.

Data Loss

Data loss is a main problem because of which the users are still not increasing rapidly. They are afraid to move into the cloud. The main problem of the data loss can be classified into two types. They are users careless to create backup and intruder's attacks (Gregor Petri, 2010). It's advisable to take frequent backup in cloud. Even it is safer we can't predict anything over the internet. In order to secure from intruders strong encryption process should be maintained to save the data's.

Data Leakage

Data leakage is similar to the data loss. Many people save their credit card details and other confidential data into the cloud. Even as we said earlier if some intruder enter into your account in cloud until it is not well protected all the data's can be breached out. So we have to use it with well password protection and high level secured encryption methodologies.

Malicious Insider

One of the hardest problem to ensure the security in all network is malicious insider. Malicious insider is nothing but the person whom access your account and communicate with all others

commonly and collect all the confidential data's and send them to others (Pelletingeas, 2010). It's very hard to ensure the protection. But the only way to avoid this problem is to keep the administration privilege to the trustable users only and frequently monitoring the network traffic.

Insecure Interfaces

Insecure interfaces means the application programming interfaces (API) for the cloud to which the user can easily communicate with the cloud. But the threat is hackers keep malicious software's and bug's inside the API. So, without knowing the problems going in there, the user will include all the confidential data's and they will be taken out by hackers.

Cloud Deployment Models

The cloud services can be defined into mainly three types based upon their character and usages. Already we know that these services can be also said as the cloud deployment models. The main types of cloud deployment models are Software as a Service (SaaS), Platform as a Service (PaaS) and the Infrastructure as a Service (LaaS). Let we see about in details about these models.
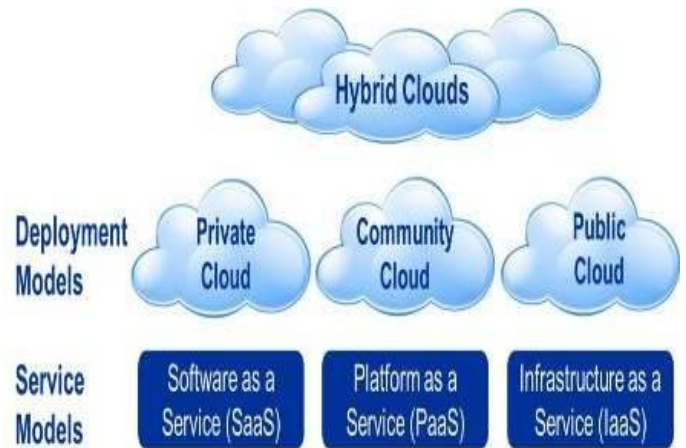

Fig.4.1 Cloud computing Deployment model

Cloud Software as a Service (SaaS)

The capability provided to the consumer is to use the provider's applications running on a cloud infrastructure. The applications are accessible from various client devices through a thin client interface such as a web browser (Fox, 2010). The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, storage, or even individual application capabilities, with the possible exception of limited user specific application configuration settings.

Cloud Platform as a Service (PaaS)

The capability provided to the consumer is to deploy onto the cloud infrastructure consumer-created or acquired applications created using programming languages and tools supported by the provider (Brodkin, 2008). The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, or storage, but has control over the deployed applications and possibly application hosting environment configurations.

Cloud Infrastructure as a Service (IaaS)

The capability provided to the consumer is to provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications (Rob Lovell, 2009; John Bair and John Rhoton, 2010). The consumer does not manage or control the underlying cloud infrastructure but has control over operating systems, storage, deployed applications, and possibly limited control of select networking components.

Advantages of Cloud Computing

We have a lot of reasons to move towards the cloud computing. Some of the valuable advantages provided by cloud computing has been shown below (Ragnet and Christopher Leach, 2010):

Cost Savings

The cloud promises to reduce the cost of acquiring, delivering, and maintaining computing power, a benefit of particular importance in times of fiscal uncertainty (Gartner *et al*., 2008). By enabling agencies to purchase only the computing services needed, instead of investing in complex and expensive IT infrastructures, agencies can drive down the costs of developing, testing, and maintaining new and existing systems.

Mobile Access

The cloud promises universal access to high-powered computing and storage resources for anyone with a network access device. By providing such capabilities, cloud computing helps to facilitate telework initiatives, as well as bolster an agency's continuity of operations (COOP) demands.

Scalability and Capacity

The cloud is an always-on computing resource that enables users to tailor consumption to their specific needs. Infinitely scalable, cloud computing allows IT infrastructures to be expanded efficiently and expediently without the necessity of making major capital investments http://searchengine watch.com/362. Capacity can be added as resources are needed and completed in a very short period of time. Thus, agencies can avoid the latency, expense, and risk of purchasing hardware and software that takes up data center space and can reduce the traditional time required to scale.

Resource Maximization

Cloud computing eases the burden on IT resources already stretched thin, particularly important for agencies facing shortages of qualified IT professionals.

Collaboration

The cloud presents an environment where users can develop software-based services that enhances collaboration and fosters greater information sharing, not only within the agency, but also among other government and private entities.

Customization

Cloud computing offers a platform of tremendous potential for creating and amending applications to address a diversity of tasks and challenges (Kelly Sees Economy, 2009). Its inherent agility means that specific processes can be easily altered to meet shifting agency needs, since those processes are typically changeable by making a configuration change, and not by driving redevelopment from the back-end systems.

Fig.6.1 Cloud computing Evolution (Tm mather *et al*., ?)

Reliability

Services using multiple redundant sites can support business continuity and disaster recovery.

Fig.6.2 Top Public Cloud Uses (State of the Cloud Report by Right scale in 2015, 2015 Righscale inc)

Maintenance

Cloud service providers do the system maintenance, and access is through APIs that do not require application installations onto PCs, thus further reducing maintenance requirements.
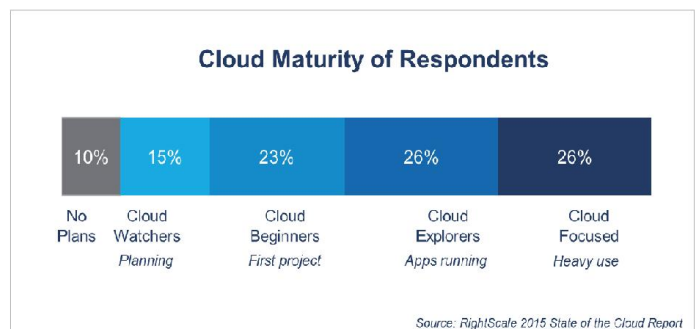

Fig.6.3. Cloud Maturity Respondents (State of the Cloud Report by Right scale in 2015, 2015Righscale inc)

Evolution of Cloud Computing

The Cloud computing has an emerging growth in the last decade, initially the users were very low without knowing the

advantages of it. The below image shows the evolution of cloud computing from 1980's to 2010. Many companies providing cloud services to the end user as a service and also as a business. Some of the leading public cloud enterprises and the SMB along with the application they providing are shown in the below figure 6.2. The cloud maturity respondents show the graphical statistics of cloud watchers, cloud beginners, cloud explorers and cloud focused users.

Conclusion

The increase in business concern on cloud computing field has raised its importance in various research fields. Besides the threats on security of information, the economic benefits from the shared resources and simplified infrastructure the cloud computing is still in its limelight. The most important and needed advantages in the current environment is green computing. The cloud computing has its own share of contribution in the implementation of green IT industry by sharing the resources across the various region.

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