

Cloud Computing: Threats and Security Issues

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Abstract

Cloud Computing is an emerging concept in global IT world. It refers to a computing system in which the task is assigned over the internet by on-demand and pay on utilization basics. Most organizations are not willing to accept the cloud computing concept due to some security issues, even though some potential gain is there in cloud computing. Security is one of the primary issues which hamper the growth of the cloud. Due to the lack of security, it is difficult to maintain the sensitive and confidential data of users. This paper introduces a detailed analysis of cloud computing security risk and threats associated with it, which are affecting the various stake-holders linked to it.

Keywords: Cloud Computing, IaaS, PaaS, SaaS, Public cloud, Private Cloud.

Introduction

Several trends are opening up the era computing, which is an Internet-based development and use of computer technology. The ever cheaper and more powerful one is cloud computing. Cloud computing' is a somewhat imprecise term to describe users 'renting' or borrowing online software. By this we can easily avoid Purchasing and installing software on our machines. It is the same business model as people using Gmail or Yahoo mail services, but the cloud computing concept goes some more extend by including daily computing activities. Most of the employees run their computer tool as online rented product. All action like processing work, saving files were done in cloud of the internet and user will connect to the cloud and do their day to day activities.

Cloud computing services are available in almost all computer system aspects. A definition for Cloud computing was published by The US National Institute of Standards and Technology(NIST) such as :*Cloud computing is a model for enabling convenient, on-demand network access to a share pool of configurable computing resources(eg:networks,servers,storage,applications and services)that can be rapidly provisioned and released with minimal management effort or Service provider interaction*[1].While the US NIST definition also includes three primary service models such as

Infrastructure as a service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS) which is shown in figure 1:

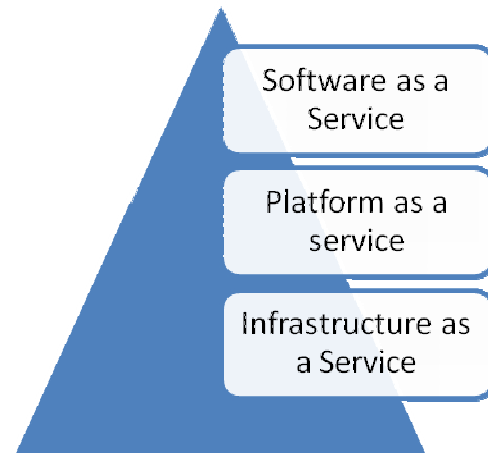


Fig1: Service models of Cloud Computing

- a) Infrastructure as a service (IaaS): Infrastructure as a Service (IaaS) is a way of delivering Cloud Computing infrastructure – servers, storage, network and operating systems – as an on-demand service Ex: Amazon.com[2]
- b) Platform as a Service (PaaS): It is the set of tools and services designed to make coding and

deploying those applications quick and efficient
Ex: Google Apps.

- c) Software as a Service(SaaS) : SaaS applications are designed for end-users, delivered over the web Ex: Salesforce.com

There are also four different cloud deployment models .Below shows the detail about each model..

- a) Public cloud: services and infrastructure are provided to different clients.best example for public cloud is Google.It helps to reduce capital expenditure and bring down operational IT costs.
- b) Private cloud: Its related to providing services for a single which is managed by Organization or third partyand may exist on premise or off premise [4].
- c) Community Cloud: Here the cloud infrastructure is shared by several organizations and supports a specific community that has shared concerns.
- d) Hybrid Cloud: It's a combination of two or more clouds (private, community, or public) that remain unique entities but are bound together by standardized or proprietary technology that enables data and application portability.

Moreover, cloud computing offers many advantages to the consumers, but it also has some security issues. This paper deals with the various security risk and threats associated with the cloud computing. This paper is originated as follows: section 2 deals with the security issues of the cloud computing Section 3 deals with the top treats of the cloud computing and section 4 deals with the conclusion derived from the study.

Security Issues on Cloud Computing

Cloud computing is a emerging technology with shared resources, lower cost and rely on pay per use according to the user demand. Due to many characteristics it has effect on IT budget and also affect security and privacy..All these issues are discussed here [6].

Privacy issue

It is the human right to secure his private and sensitive information. The data privacy is also one of the key concerns for Cloud computing. A privacy steering committee should also be created to help make decisions related to data privacy. This committee will ensure that your organization is prepared to meet the data privacy demands of its customers and regulators. Data in the cloud is usually globally distributed which raises concerns about jurisdiction, data exposure and privacy. Organizations stand a risk of not complying with government policies as would be explained further while the cloud vendors who expose sensitive information legal risk liability [7]

Security

Public cloud increases the privacy issue and very much concern about security.Some of them are described below:

Access

It has the threat of access sensitive information. The risk of data theft from machine has more often occur in cloud system.Some useful data stored in cloud for a long time can be hacked by the hacker.

Multi-tenancy

Cloud service provider uses multi-tenant application of cloud to reduce cost by using virtual machine but it increase more vulnerability

Trust

The most important term for a business is "trust". Still cloud is failed to make trust between customer and provider. The main problem in deploying cloud services is Weak trust relationship and lack of customer trust.

Top Threats of Cloud Computing

Although there are cloud service providers who provide some sterling services, but some threats are still there in cloud computing that must be addressed before going for it. Sometimes small dangers occur to information or system it's called as Threat. Basically threat is said to be someone or something, identifying a specific culpability and use it against a company or person. The threats escapade culpability in an attempt to cause damage or destruct a resource. A "Threat Agent" is the entity that takes advantage of vulnerability. A threat agent could be an intruder, a process, or an employee making an unintentional mistake that could expose confidential information or destroy file's integrity. The following are some of the common threats to cloud computing [3].

Malicious insiders

Malicious insiders are dangerous both inside organizations and with cloud providers. They could gain access to confidential information about a business and may sometimes harm it. Cloud Service providers should be transparent about some process like procure people, concede and keep an eye on them.

Insecure interfaces

Customers use Application Programming Interface (API) to interact with cloud services. Cloud APIs with weak authentication and access control can expose the confidentiality ,integrity and availability of the associate customer .As the services are spread over a large area of users, any amenableness in the PI can be exploited for malicious intents..

Data loss and leakage.

Data are always being stolen by unauthorized users. Cloud data's are prone to some threats like

deletion or modification of record, encryption key loss which may result in data corruption. Due to the corruption of data, organization can lose their data which can have devastating impact on business.

Account hijacking

Usually the attacker gather important data, modify the data, falsify transactions, and also redirect the client to some other unauthorized sites. Strong authentication techniques, security policies and monitoring should prevent this from happening.

Abuse of cloud computing

Initial registration with a cloud computing service is a very easy process. Almost in many cases the service provider will provide free trial period. Most Organization should consider some risk like unwarranted sign up, exiguity of testament, service fraud and specified- services.

Shared technology issues

Cloud computing allows multiple organizations to share and store data on servers. However, the original server hardware and operating systems were most likely designed for use by a single tenant (one organization). Sometimes the Organization should check whether appropriate controls are placed to make the data secure. [5].

Conclusions

Cloud computing helps IT enterprises use various techniques to optimize and secure application performance in a cost-effective manner. This paper described numerous security issues facing by cloud computing and cloud operating system. Security issues are mainly focused on users and servers. Important issues related to security were discussed that all users and organizations should be aware of when deciding whether to use the cloud or not.

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