



“Cloud Computing And Its Security”

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Abstract-The term Cloud computing itself was coined in 1996 within a Compaq internal document. The term Cloud was originally linked to the concept of distributed computing, which went mainstream at apple spawned general magic in the early 1990s. we describe Cloud computing models in this models there are two types one is Deployment model and second is Service model, And also describe cloud security, how to handle its security.

Keywords-CloudComputing,Model,Service Model,Saas,Paas,Iaas ,Security.

I. INTRODUCTION

Cloud computing consists of three distinct types of computing services delivered remotely to clients via the internet. Clients typically pay a monthly or annual service fee to providers, to gain access to systems that deliver software as a service, platforms as a service and infrastructure as a service to subscribers. Clients who subscribe to cloud computing services can reap a variety of benefits, depending on their particular business needs at a given point in time. The days of large capital investments in software and IT infrastructure are now a thing of the past for any enterprise that chooses to adopt the cloud computing model for procurement of IT services. The ability to access powerful IT resources on an incremental basis is leveling the playing field for small and medium sized organizations, providing them with the necessary tools and technology to compete in the global marketplace, without the previously requisite investment in on premise IT resources. Clients who subscribe to computing services delivered via the “cloud” are able to greatly reduce the IT service

expenditures for their organizations; and gain access to more agile and flexible enterprise level computing services, in the process.

II. CLOUD COMPUTING

Cloud computing is a general term for anything that involves delivering hosted services over the internet. These services are divided into three main categories or types of cloud computing: Infrastructure as service (IaaS). Platform as service (PaaS). And Software as a service (SaaS). And the other side is deployment model in these models there are three types public cloud, hybrid cloud, and private cloud.

III. CLOUD COMPUTING MODELS

There are two types of model in cloud computing

Deployment Model-

The cloud computing deployment model identified the specific type of cloud environment based on ownership, scale, and access, as well as the cloud’s nature and purpose. The location of the servers you’re utilizing and who control them are defined by a cloud deployment model. It specifies how your cloud infrastructure will look, what you can change, and whether you will be given services or will have to create everything yourself. Relationship between the infrastructure and your users are also defined by cloud deployment types.

Different types of cloud computing deployment model are: -

1. Public cloud
2. Hybrid cloud
3. Private cloud

1. Public Cloud

Public Cloud is an IT cloud model that works on-demand computing services. In this cloud model, the infrastructure is managed by a third-party provider. Third-party providers share this cloud with several organizations with the help of the Internet. The public cloud model provides cloud service in different formats, including providers' infrastructure as a service (IaaS), platform as a service (PaaS), business as a service (BaaS), and software as a service (SaaS). These cloud services are provided to users for either a monthly or pay-per-use fee, eliminating the need for users to host these services on-site in their own data center.

2. Hybrid cloud

A hybrid cloud model combines on-premises IT (traditional infrastructure and private cloud) with off-premises resources or services from a public cloud—such as Google Cloud Platform (GCP), Amazon Web Services (AWS), or Microsoft Azure—or at a cloud service provider (CSP). In a stricter definition of hybrid cloud, it is a computing environment built from a combination of different clouds that could include both private and public clouds as well as CSPs. In a three-tier application stack, the presentation service might be on a public cloud, the application service might reside on a managed private cloud, and the database service might reside on-premises. The arrival of cloud computing to enterprise IT brought much more than new business value and end-user utility. An entirely new set of terms was created to describe the many varieties of virtual data storage and transmission.

3. Private cloud

Private cloud is when a single business entity or end-user has sole access to the hardware and software resources designated in a specific cloud computing environment. Private cloud is similar to other forms of cloud environments in that it offers virtualized resources via physical components. Private cloud environments can be hosted at an organization's on-site data center, although more organizations are turning to third parties that either act as a colocation facility or are providers of hosted private cloud services.

Service Model -

There are the following three types of cloud service models -

1. Infrastructure as a Service (IaaS)
2. Platform as a Service (PaaS)
3. Software as a Service (SaaS)

1. Infrastructure as a Service (IaaS)

IaaS (Infrastructure as a Service) offers the most control over computing resources but is hardly considered a plug-and-play style service. An IaaS provider delivers resources to a client,

and the client is able to use those resources free of an initial investment. As a client, you basically have the ability to serve yourself — think of it as an all-you-can-eat buffet, except you have to pay for each individual item you put on your plate. It's flexible and scalable, and you pick and choose what you need. However, as a client, you absorb much of the responsibility that comes with that infrastructure. This typically includes the operating systems, applications, and data itself.

2. Platform as a Service (PaaS)

PaaS (Platform as a service) provides users with cloud-based platforms for developing, running, and managing applications. The cloud provider hosts the software and hardware on its infrastructure and delivers users integrated platform solutions as a stack or service via an internet connection. They also provide support services for security, system and software upgrades, and backups. PaaS is primarily useful for programmers and developers and allows users to develop, run, and manage applications without maintaining the underlying infrastructure. Users can code, build, and manage applications without having to deploy software updates or manage hardware maintenance. Instead, the PaaS provider creates and deploys the computing environment. PaaS solutions include Microsoft Windows Azure, AWS Elastic Beanstalk, and Google App Engine.

3. Software as a Service (SaaS)

SaaS (Software as a Service) is among the three most important cloud computing categories, alongside IaaS (Infrastructure as a Service) and PaaS (Platform as a Service). A software delivery model, SaaS, is offered by cloud service providers that host various applications in the cloud and make them accessible to users via the Internet. An organization that leases software using a cloud-based, centralized system can qualify as a Software as a Service provider. The SaaS vendor maintains servers, databases, and other hardware to ensure seamless delivery of SaaS products. Unlike PaaS and IaaS, Software as a Service is marketed to B2C and B2B users. There are various SaaS products on the market today for everyone, ranging from productivity tools, such as Google Workspace, to personal entertainment, for instance, Netflix.

IV. Security

Security in cloud computing is a major concern. Data in cloud should be stored in encrypted form. To restrict client from accessing the shared data directly, proxy and brokerage service should be employed.

- **Data security in cloud computing**

Data security in cloud computing involves more than data encryption Requirement for data security depends upon on the three service model SaaS , PaaS , and IaaS.

There are two drawback of data security in clouds Data at rest which means the data stored in the cloud and Data in transit which means data that is moving in and out of the cloud.

- **Data at rest**

Data at rest refers to data in cloud , or any data that can be accessed using internet . This includes backup data as well as live data.

- **Data at transit**

Data at transit normally refers to data which is moving in and out of the cloud . This data can be in the form of a file or database stored on the cloud and can be requested for use at some other location.

V. Security planning for Cloud

Before using cloud technology , users should need to analyze several aspect.

These are:

- Analyze the sensitivity to risk of users resources.
- The cloud service models require the customer to be responsible for security at various level of service.
- Understand the data storage and transfer mechanism provided by the cloud service provider.
- Consider proper cloud type to be used.

VI. Understanding the Data Security

As well all know the data is transferred via the internet , so one of the major concern is data security. The major point that one should adopt to secure cloud data are :

- Access Control
- Auditing
- Authentication
- Authorization

VII. RESULT

Unleash the full potential of your business through context-based experiences and mobile apps. When traditional IT and cloud are combined, it is possible to deliver all the new processes, workflows and development platforms that applications require. Computer software is hosted by a third party, and it resides in “the cloud.” This means that users don’t have to worry about things like storage and capacity, they just have to enjoy the end result.

VIII. CONCLUSION

To conclude, Cloud computing is the latest technology that promises immense benefits however there is lot of research which is still required in this area as many of the concerns related to security and privacy issues are not been answered by the experts and remains open. However, there are lot of research and investment in the area by the Information technology giants like Microsoft, Google, Cisco, IBM in this area and the day is not far when the cloud will widespread adopted and all the security and privacy issues will be handled. This report discussed about the various types of cloud service models and the risk associated with each of that. Apart from it, famous DDOS attack of 2013 also discussed and weakness of application layer is leading to attacks. I would like to say that I look forward for these types of discussion where I get a platform to gain more from the knowledge and experiences of people around me. It is expected that the use of cloud computing would increase in the coming team

IX. REFERENCES

1. Cloud computing. (2015). Retrieved from <https://med.stanford.edu/irt/security/cloud.html>
2. GCFLearnFree.org. (Producer). (2012, March 08). Computer Basics: What is the Cloud? [WebVideo]. Retrieved from <https://www.youtube.com/watch?v=gu4FYsFeWag>
3. Passary, S. (2015, June 15). Cloud computing is the future but not if security problems persist. Retrieved from <http://www.techtimes.com/articles/8449/20140615/cloud-computing-is-the-future-but-not-if-security-problems-persist.htm>
4. Savitz, E. (2013, December 11). 5 key computer network security challenges for 2013. Retrieved from <http://www.forbes.com/sites/ciocentral/2012/12/11/5-key-computer-network-security-challenges-for-2013/>
5. Spector, L. (2011, August 22). Is cloud-based backup safe?. Retrieved from http://www.pcworld.com/article/238503/cloud_backup_safe.html
6. Bradford, C. (2019). 7 most infamous cloud security breaches – storagecraft. Retrieved from <http://blog.storagecraft.com/7-infamous-cloud-security-breches>
7. Mell, P., & Grance, T. (2011). The NIST Definition of cloud Computing. Retrieved from <https://csrc.nist.gov/publication/detail/sp/800-145/final>
8. M.A. Vouk ,”cloud computing” issue , research and implementations , proc.Int.conf,inf,technol.interfaces , ITI, pp.31-40,2008.
9. V.J.Winkler, “Securing the cloud “, cloud computing secur.tech.tactic.Elsevier.,2011.