INTERNATIONAL JOURNAL OF ADVANCE RESEARCH, IDEAS AND INNOVATIONS IN TECHNOLOGY

ISSN: 2454-132X
Impact factor: 4.295
(Volume3, Issue5)
Available online at www.ijariit.com

Cloud Computing

Pratima Purohit
BNM Institute of Technology, Bengaluru, Karnataka
Department of Computer Science & Engineering
prathimapurohit@gmail.com

Thanushree .K
BNM Institute of Technology
Department of Computer Science & Engineering
srinuthak1997@gmail.com

Amulya Ramesh
BNM Institute of Technology
Department of Computer Science & Engineering
amulya.ramesh747@gmail.com

Mamatha .V
BNM Institute of Technology
Department of Computer Science & Engineering
mamthuu97@gmail.com

Abstract: In this Paper, we discuss Security issues for Cloud Computing including storage security, data security, and network security and secure virtualization. Cloud computing is an architecture for providing computing service via the internet on demand and pays per use access to a pool of shared resources namely networks, storage, servers, services, and applications. This research paper also analyses the key research and challenges that present in cloud computing and offers best practices to service providers as well as enterprises hoping to leverage cloud service to improve their bottom line in this severe economic climate.

Keywords: Cloud Computing, Cloud Security, Data Security, Security Services, Virtualization Security, Security Threats, Service Models.

I. INTRODUCTION

Cloud Computing is a distributed architecture that centralizes server resources on a scalable platform on-demand computing resources and services. Cloud Computing is one of the new concepts in recent years, and a newly computing framework is proposed. It is the development of distributed computing, parallel computing, and grid computing. Cloud service providers offer such as cloud platforms for their customers to use as well as to create their web services like ISP offers customers/users for high-speed broadband to access the internet. Cloud service provider and internet service provider both offer services.

In general cloud providers offer three types of services i.e. Software as a Service (SaaS), Platform as a Service (PaaS) and Infrastructure as a Service (IaaS) [**II].** There are some reasons for organizations to move towards IT solutions which includes cloud computing as required to pay for the resources on a consumption basis. In addition, this organization can easily meet the needs of changing markets to ensure that they always on the leading edge for their customers.

The existing implementation of cloud computing reflects characteristics of the following three aspects:

- The hardware infrastructure established on a large-scale and cheap server cluster.
- The collaborative development of application and the underlying service, maximize the use of resources.
- Through multiple redundancies between cheap servers, achieved high availability of Software.

II. CLOUD COMPUTING

Cloud computing means that practice of using the remote servers that are hosted on the internet to store, manage and process data, rather than using on the local server or a personal computer. It also describes what happens when applications and services moved into the internet "cloud". Cloud computing also refers to different types of services and applications delivered on the internet.

Many companies are using these services of the cloud computing from the year of 2010 such companies are:

Google: It is a private company who uses for delivering many different types of services to the users, which includes email access, document applications text transactions, maps and much more.

Microsoft: This Company uses online services that allow for content and business intelligence tools to be moved into the cloud. Microsoft currently makes office applications available in the cloud.

Cloud computing has a variety of characteristics

Shared infrastructure: this type of structure uses software model, which enables the sharing of physical services, storage and networking capabilities. Regardless of the deployment model, cloud seeks to make most of the infrastructure across a number of users.

- **Dynamic provisioning:** cloud allows for the provision of services based on the current demand of the users' requirements. This is done by the services of cloud computing automatically using software automation by enabling the expansion and contraction of services capability as needed. This needs to be done while maintaining the reliability and security.
- **Network Access:** Needs to be accessed across the network on the internet from a broad range of devices such as PC's, laptop and mobile devices etc. Deployment of services in the cloud include which includes from using business applications to the Smartphone.
- **Managed Metering:** metering uses for managing and optimizing the services and to provide reporting and billing information. In this way, the consumer is billed for services according to how much they will actually plan to use during on the billing period.
- **Service Models:** Once a cloud has been established, it is necessary to know how cloud computing services are deployed in terms of business models is differ depending on user's requirements.
  These models are being deployed known as
  - Software As a Service (SaaS)
  - Platform As a Service(PaaS)
  - Infrastructure As a Service (IaaS)

Infrastructure as a Service (IaaS): Software-as-a-Service (SaaS): SaaS can be described as a process by which Application Service Provider (ASP) provide different software applications over the Internet. Examples of SaaS include: Salesforce.com, Google Apps etc. The SaaS customer is an end-user of complete applications running on a cloud infrastructure and offered on a platform on-demand. The applications are typically accessible through a thin client interface, such as a web browser.

Platform as a Service (PaaS): It is the delivery of a computing platform and solutions that provide service without software downloads or installation for developers, IT managers or end-users. In the case of PaaS, the cloud provider not only provides the hardware, but they also provide a toolkit and a number of supported programming languages to build higher-level services. Examples of PaaS include Force.com, Google App Engine, and Microsoft Azure.

Infrastructure as a Service (IaaS): The capability provided to the customer of IaaS is raw storage space, computing, or network resources with which the customer can run and execute an operating system, applications, or any software that they choose. Infrastructure as a service (IaaS) refers to the sharing of hardware resources for executing services using Virtualization technology. Its main objective is to make resources such as servers, network, and storage more readily accessible by applications and operating systems. Examples of IaaS include Amazon Elastic Cloud Computing (EC2), Amazon S3, Go Grid.

The most important external characteristics of cloud computing are the IT resource service. At present, Google, IBM, Amazon and Microsoft, sun and other IT companies establish and provide all kinds of cloud computing services.

KEY SECURITY ISSUES IN CLOUD COMPUTING AND CLOUD SECURITY

Cloud computing and web services run on a network structure so they are open for attacks. One of them is distributed denial of service attack. When a user tries to hijack the server the hacker will stop the work doing based on the web services from functioning and put the services online. To stop is attack they introduce of using the cookies and a limited number of users to access connected to the network. The middle attack has been done through the client and server authentication is not done properly. So the security issues play a very important role in the cloud computing.

Cloud computing consists of applications, platforms and infrastructure segments. Each segment performs different operations and offers different products for businesses and individuals around the world.

The Security issues of Cloud Computing is as given below:

- Access to Servers & Applications
- Data Transmission
- Data security
- Data privacy
- Data Integrity
- Data Availability

Data Security: For users, Data security is quite easy to find the possible storage on the side which offers the service of cloud computing to achieve the services of cloud computing. The most common communication protocol is Hypertext transfer protocol (HTTP). In order to assure the information security and data integrity, Hypertext Transfer Protocol Secure (HTTPS) and Secure Shell (SSH) are the most common adoption.

Access to Servers & Applications: The applications of cloud computing are practically limitless. With the right middleware, a cloud computing system could execute all the programs a normal computer could run. Potentially, everything from generic word processing software to customized computer programs designed for a specific company could work on a cloud computing system.

Data Transmission: Security in Data Storage and Transmission in Cloud Computing. Cloud Computing has been envisioned as the next-generation architecture of IT Enterprise. In the cloud, the data is transferred among the server and client. High speed is the important issue in networking.

Data Privacy: Data security issues are primarily at SPI (SaaS, PaaS, and IaaS) level and the major challenge in cloud computing is data sharing. ... Data privacy issues and technologies in the cloud are also studied because data privacy is traditionally accompanied with data security.

Data Integrity: Data integrity in cloud storage. Abstract: Cloud computing is a promising computing model that enables convenient and on-demand network access to a shared pool of configurable computing resources.

Data Availability: Data availability is a term used by some computer storage manufacturers and storage service providers (SSPs) to describe products and services that ensure that data continues to be available at a required level of performance in situations ranging from normal through "disastrous".

RESEARCH ON CLOUD COMPUTING SECURITY THREATS USING DATA TRANSMISSION

The cloud computing plays an important role in the industry and academic with rapid development with hardware and software requirements of the users. The cloud computing factors such as traditional computer technology and a business mode. It provides the service to the user with the terms of scalability and reliability. Cloud computing means that internet computing, a collection of clouds thus it can be referred as utilizing the internet to provide technology services to the people and organization. It also provides the users to access the internet through the online system. Nowadays there are three main types of cloud computing environments such as public, private, hybrid as it has been defined above. There are three main types of services in the cloud environment SaaS, PaaS, IaaS. For having good and high performance, cloud provider must meet several management factors such as

- Availability management
- Access control management
- Vulnerability and problem management
- Patch and configuration management
- Countermeasure
- Cloud system using an access monitoring

FEATURES OF CLOUD COMPUTING

The main feature is that it allows for sharing and scalable deployment of services, as needed from any location and which the customer can be billed based on the usage.

- **On-demand self-service:** A consumer can provision computing such as server time and network storage which is needed automatically without any human interactions.
- **Broad network:** The user can access through the internet from a broad range of devices such as laptop, PC's, mobiles etc
- **Resources pooling or shared infrastructure:** The computing resources of services are pooled to multiple consumers using a multi-tenant model with different physical and virtual resources. Examples of resources include storage, processing, memory, network bandwidth etc
- **Rapid elasticity:** The consumer feels that capabilities are available with unlimited access to the internet.

BENEFITS

Cost Savings: This can be done in the way that companies can reduce their capital expenditure and use operational expenditure for increasing computing capabilities.

Scalability/Flexibility: This is used in the form of where companies can start with a small deployment and grow to large deployment rapidly, and the scale back if necessary. Using of extra resources to satisfy consumer needs is another way of scalability/flexibility.

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

Maintenance: Maintaining the services and applications of cloud computing is comparatively easy.

Mobile Accessible: Mobile networks have increased productivity due to a system accessible in an infrastructure available from any ware.

CHALLENGES

The following are some of the notable challenges associated with cloud computing.

- Security and Privacy
- Lack of Standards
- Continuously Evolving
- Compliance Concerns

REFERENCES

- Introduction to Cloud Computing [1]
- Architectural Components of Cloud Computing [2]
- Cloud Computing [3]
- Characteristics of Cloud Computing [4]
- Service Models [5]
- External Characteristics [6]
- Key security Issues and Cloud Security [7]
- Security Issues of Cloud Computing [8]
- Research on Cloud Computing Security Threats Using Data Transmission [9]
- Features of cloud computing [10]
- Benefits [11]
- Challenges [12]
- Conclusion [13]

CONCLUSION

The application of cloud computing allows achieving more in the hardware and software investments. Pooling of resources into large clouds reduces the costs and increase the utilization and delivering to the users as they needed until the resources are available. The data security issues under cloud computing environment have become a key consideration for users to choose it. The challenge is also unprecedented. A cloud security Framework is proposed through the research on data security in cloud computing security mechanism. Cloud computing security refers some problems, such as technology, standardization, business regulations, laws and regulations, and many other fields. So, only from a technical perspective to solve safety problems of cloud computing is not enough, need the joint efforts of information security in academia, industrial circle, enterprise, government and related departments.

REFERENCES

[1]. Changyou Guo, Xuefeng Zheng, Raj Kumar "Research *on Cloud Computing*" Jan 2015, 3, 2277 128X.
[2]. Rabi Prasad Padhy, Manas Ranjan Patra, Suresh Chandra Satapathy "*Security Issues*" Vol. 1, No. 2, Dec 2011
[3]. Monjur Ahmed, Mohammad Ashraf Hossain "Cloud *Computing*" Vol 6.No.1 Jan 2014.
[4]. Anurag S. Barde, K. Won, "*Cloud computing: Today and tomorrow*," Journal of Object Technology, vol. 8, no. 1, pp. 65-72, 2009.
[5]. Santosh Kumar, R. H. Goudar"*Research Issues, Challenges, Architecture, Platforms, and Applications*" International Journal of Future Computer and Communication, Vol. 1, No. 4, December 2012
[6]. A. Kundu, C.D. Banerjee, P. Saha,"*Introducing New Services in Cloud Computing Environment*", International Journal of Digital Content Technology and its Applications, AICIT, Vol.4, No.5, pp.143-152, 2010.
[7]. Rabi Prasad Padhy, Manas Ranjan Patra, Suresh Chandra Satapathy" *Key Security Issues in Cloud Computing*" IJCSITS Vol. 1, No. 2, December 2011
[8]. B.R. Kandukuri, R.V. Paturi, and A. Rakshit," *Cloud Security Issues*," 2009 IEEE International Conference on Services Computing, Bangalore, India, September21-25,2009.
[9]. J.F. Yang and ZB. Chen, "*Cloud Computing Research and Security Issues*,"2010 IEEE International Conference on Computational Intelligence and Software Engineering (CSE), Wuhan pp. 1-3, DOI=10-12 Dec. 2010.
[10]. Amol C. Adamuthe, Vikram D. Salunkhe, Seema H.Patil "Features *of Cloud Computing*" September 2015, 10, 42-53/DOI: 10.5815/ijitcs.2015.10.06
[11]. Anurag S. Barde "Benefits" International Journal of Computer and Communication Engineering, Vol. 2, No. 4, July 2013
[12]. T. Dillon, C. Wu, and E. Chang, "*Cloud Computing: Issues and Challenges*,"2010 24th IEEE International Conference on Advanced Information Networking and Applications (AINA), pp. 27-33, DOI=20-23 April 2010
[13]. Santosh Kumar and R.H.Goudar "Conclusion *of Cloud Computing*" International Journal of Future Computer and Communication, Vol.1, No.4, December 2012.

