

Semantic Representation of Data Security for Centralizing Data Storage in Cloud Environment

Prof.T.Aravind¹, Dr.G.Vijayakumar²

¹Assistant Professor - Department of Computer Science and Engineering,

Muthayammal Engineering College,

Rasipuram – 637 408, India

taravindcse@gmail.com

²Associate Professor,

Department of Electrical and Electronics Engineering,

Muthayammal Engineering College,

Rasipuram – 637 408, India

vijayakumargovind@yahoo.com

ABSTRACT

Computing world is based on the Internet, featured by the rapid development and application of computer technology. The cloud computing technology plays a vital role on shaping a new era. The Cloud computing technology is associated along with distributed computing, parallel computing, grid computing, Virtualization technologies; property- based remote attestation technologies, etc. Cloud computing potentially extends an overall economic and financial benefit, in that users share a prominent data, centralizing data storage and computing resources, rather than possessing and handling and managing their own systems. The cloud computing market and development are growing rapidly and bringing up numerous challenges and big security issues. Cloud computing is required to extend the capacities, including, trusted encryption system to assure safe, data-storage and easy manage the environment; demanding strict attention access control; safe and resistant to change of position backup of user data Some issues concern on the cloud computing is the security and confidentiality of user data in terms of its location, relocation, availability and security. In this paper we will focus on the basic way of cloud computing development, growths and common security issues arising from the usage of cloud services.

Keywords: Cloud computing,

Security,

SaaS,

Cloud Security,

Internet.

1. INTRODUCTION

Today world cloud computing is very vital role play in technology fields, as we say that cloud computing is a technology that expands the internet and central remote servers holding data and applications. This cloud computing technology allows customers for much more efficient computing and accessing data & files by centralizing data storage and processing. Cloud computing is new demands and delivery model for IT services in present worldwide, is also modern Information System design; this is very useful for users those not understanding the operating systems, client-server architectures, and browsers. Cloud computing has provided users from hardware requirements and reducing overall client- side demands and complexity.

Cloud computing potentially extends an overall economic and financial benefit, in that users share a prominent data, centralizing data storage and computing resources, rather than possessing and handling and managing their own systems [1]. Cloud computing provide resources and service on an as needs' basis, frequently employing existing data focuses as a basis, the service providers of cloud computing invest in the essential infrastructure and management systems, and in return receive a time-based or usage-based information for end users [2]. The user in becoming checks opportune benefits from having data and services to be easily obtainable through anywhere in the world, Managing database in centralizes, the availability of increased capacity when the user needed, and usage-based appointing [3, 4]. The cloud computing itself generally includes prominent numbers of servers, harnessed to make a delivery extremely scalable and trust or authentic on-demand services. Many companies allow for the cloud computing platform such as Amazon, Google, Microsoft, IBM, VMware and EMC , ETC. The amount of resources provided in the cloud computing is dependence upon users if they need more information or resource, then is increased and decrease when they need lee's information. The cloud computing have the power to perceive by sight as the important transformation of information system industry and will make more effect of the growth of information technology for the company, the cloud computing services are reachable anywhere in the world through the help of the internet, is also changed of the style of software the user can use data at any time and in anywhere. That cloud computing is developing paradigm finally fixed by developers and early access and understand. Working necessitates an examination of its functional attributes, show the characteristics that fix the true value of cloud computing for the enterprise.

2. CONCEPT OF CLOUD COMPUTING

Cloud computing is a universal term for anything that demands delivering hosted services over the Internet. The data storage and processing are not in the client computer and server, but all processing distributed over the internet in the cloud computing. Any task's moves to a personal computer to the large computing center who are shared with total user and distributed over the internet, cloud computing transforms the processor, storage device and other physical resources on the Internet to being actually such in almost every respect resource, which is expandable and can be shared. The cloud computing normally divided into two parts client end and back end, they associate with each other

through the internet, the client end-user access service through own PC, Mini-notebook, Mobile, etc. to process and store the information which provided by the back end.

IJIREST

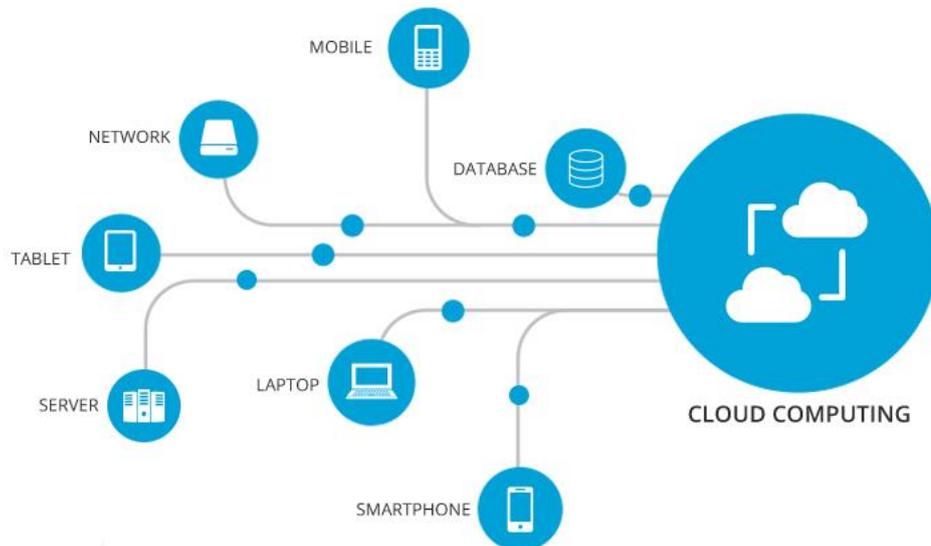


Fig. 2.1 Cloud Computing

2.1 Types of Cloud Computing

We have to discuss here the type of cloud computing and basic architecture or development approaches .

Normally cloud computing is divided into three types:

Public, Private and hybrid but one is also that is called cloud computing community. They have different key features in every model choice one to meet your business's need fulfill [5].

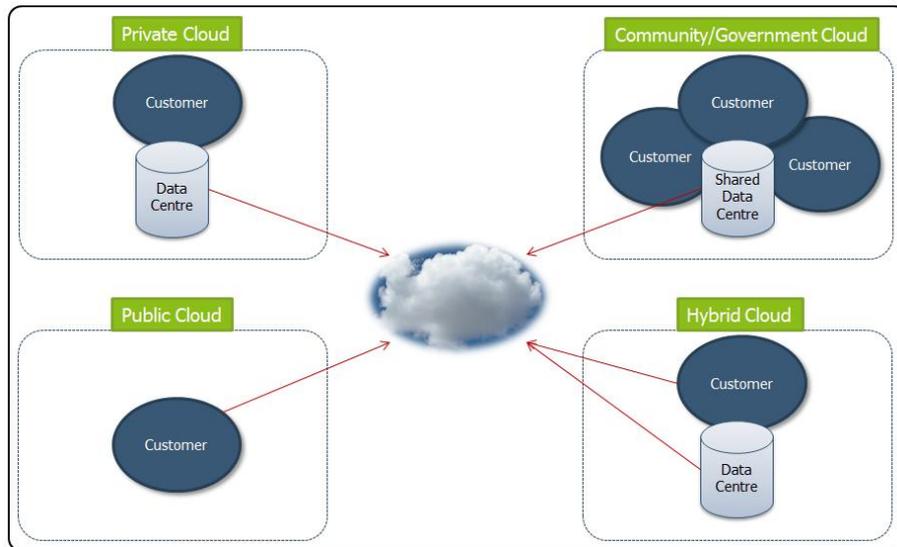


Fig. 2.2 Types of Cloud Computing

Public Cloud: Public cloud draws in the traditional mainstream sense hosted and managed by the service providers, in the public cloud resources are dynamically the provision on self- service ground over the internet, through web application services, from an off-site third-party provider who shares resources and bills on a fine-grained utility computing basis and also public cloud storage is higher than other clouds.

Private cloud: Private clouds are proprietorship networks commonly residing within the enterprises generally for the exclusive use; this networks very popular nowadays on business organization. In case of Private Clouds, maintaining cost is high; data is much more secure than a public cloud computing.

Hybrid cloud: A hybrid cloud environment consisting of multiple public and Private cloud computing providers [6]. The hybrid cloud infrastructure is much more effective on the term of security and access data because of enhanced control and management by the enterprise itself.

Community cloud: Community Clouds are very similar to public clouds only that their access is fixed to a particular community of Cloud consumers.

2.2 Services of Cloud Computing

The Cloud model comprises basically three types of services: Software Services, Platform Services and Infrastructure Services. These are associated to three delivery models.

Software as a Service (SaaS): This basically refers to “on-demand software.” SaaS has delivered many business applications rebuilt pieces of software or complete applications like, including accounting, collaboration, customer relationship management (CRM), management information systems (MIS), enterprise resource planning (ERP), invoicing, human-resource management (HRM), content management (CM) and service desk management. [7] Also provides email system, database processing, etc.

Platform as a Service (PaaS): This model is a way to ripped hardware, operating systems, storage and network capacity over the Internet. PaaS helped to run the application on the web also provide application development toolkits. PaaS applications are also looked up to as on-demand, Web-based, or software as service (or SaaS) solutions.

Infrastructure as a service (IaaS): This model provides considered infrastructure as a Service, is a highly automated offering where computer resources, complemented by storage and networking capabilities, are offered to the customer on-demand. IaaS is best practices, hybrid cloud, security and risk management, and regional market evolution. It has also helped to cost saving, efficiencies while modernizing and expanding their IT capabilities without spending capital resources on infrastructure.

2.3 Landscape and Growth of cloud computing

We discuss here the landscape and growth of cloud computing. The today’s world business market that demonstrates around Cloud Computing is growing rapidly to carry out the users’ requirements soon. Gartner Inc. predicts that Cloud Computing revenue will pass by \$150 Billion in year 2013 [8].

PaaS	IaaS	Cloud Security	Private Cloud	Cloud Storage	APaaS
Windows Azure	Amazon	IBM	Red hat	Asigra	Work Xpress
WSO2	OpSource	Blue Coat	VCE	EMC2	Wolf
Amazon	AT&T	Dome 9	Think Grid	Nirvanix	Appian
Cloud Control	CSC	Zscaler	Scale Matrix	Twin Strata	LongJump
GON DOR	Cloud Sigma	Symplified	enomaly	Coraid	Cordys
Tiny Flock	NaviSite	Novell	Xtium	Zetta	Caspio
JGate	Terre Mark	Voltage	Hexagrid	Amazon	expanz
Pi Cloud	Rackspace	Cloud Passage	Vision App	Stor simple	Roll base
Dot Cloud	SAVVIS	Still Secure	Quest Software	3X system	Force.com
App Harbor,	SUNGARD,	enstratus,	Zimory,	Doyenz,	Wave Maker,

Table 2.1 Landscape of cloud computing vendors [9].

The research suggests that the cloud computing industry one of the several parts is significant and growing in worldwide According to a recent study by Gartner; cloud service's revenue was projected at approximately \$68.3 billion in 2010, and the industry is poised for strong growth through 2014, when world-wide cloud service's revenue is projected to reach \$148.8 billion[10]. Other research by IDC in tram of IT services exceeded \$21.5 billion in 2010 and will reach \$72.9 billion in 2015, constituting a stronger annual growth rate (CAGR) of 27.6%. This rapid growth rate is so fast and over four times the projected growth for the worldwide IT marketed as a whole (6.7%). By 2015, every seven dollars spent on software, servers, and storage offerings will be through the public cloud model[11]. Cloud computing plays a vital in Europe's GDP; they belong to biggest five economies, 1 and 2 % of GDP[12].

Cloud computing will add approximately 15.8 million jobs to the worldwide economy by 2014[13]. All those reports showed the cloud computing growth in worldwide and role of cloud in software industry and economic.

3. CLOUD COMPUTING SECURITY'S ISSUES

Cloud Computing predicts so many benefits but still there are also numerous issues and challenges for organizations covering the Cloud technology. Privacy of sensitive data is of paramount importance, and having dedicated servers is essential if the Cloud environment is to be accepted. The cloud computing is extended in the internet, and the internet is also some security issues; Cloud computing is required to extend the capacities, including, trusted encryption system to assure safe, data-storage and easy manage the environment; demanding strict attention access control; safe and resistant to change of position backup of user data.

La'Quata Sumter et al. [14] says: The rise in the scope of cloud computing has brought fear about the Internet

Security and the threat of security in cloud computing is continuously increasing. Today's consumer is serious concerns about cloud computing services the availability of their data when required. The cloud computing must be allowed for data control system for the user to access data and the data security audit also can be deployed in the cloud computing system. The cloud allows users to obtain the computing power which exceeds their own physical domain. This leads to several security problems. Here we will discuss with some important security and privacy fact of cloud computing concerns in mind.

Access data and control: So many data are moving here to there though cloud computing having a higher chance to be the confidential data and information to be illegally accessed due to the astringent access control over the internet, and unauthorized access may exist if internet security is not higher. As data normally live in the Cloud for a long period of time, that's why the risk of illegal access is higher. So must be secure database through authentication.

Secure data transfer over the cloud: All the traffic moving data between your network and any service if you want to access in the cloud must cross the Internet. Make sure your data is always traveled on 'https' and secure browser data should be constantly be encrypted and authenticated.

Data availability: When the client data are fertilized, clients no longer possess any data on the cloud. Personal information or any data on the Cloud in not available either lost or heck, it is difficult to retrieve the original data. So availability is a major concern about the Cloud Computing security and privacy.

Backup and Recovery: The cloud computing organization provide must be high and superior backup and recovery policies to be easy to store and retrieved data. Data should be securely encrypted when it's on the provider's servers and while it's in use by the cloud service.

Data Segregation: Data in the cloud is typically in a shared environment alongside data from other computer.

Data separation: A particular cloud computing service provider not only handles your organization's data, but also at the same time manages data for various other companies.

Insecurity concern, risk is also an area that the user thought about cloud computing; we show a table of the security guide was concentrated to some of the most common risks of cloud computing.

Risk	Description
Data Loss	The threat of data compromise increases in the cloud; data loss is more dangerous because of the architectural or operational characteristics of the cloud computing.
Malicious Insiders	A service provider may not reveal how it grants employees access to physical and virtual assets, also problem with monitoring the user.
Account hacking	Account hacking is one of the major problems of cloud computing today.
Mobile services	Through mobile service is also facing some problems. In 2011 we saw a greater volume of malicious attacks on key platforms such as Android . IT security professionals will need to deal with rapidly evolving mobile platforms, each with a unique set of risks.
Cloud services are back in vogue	Some companies were slow to adopt cloud services because of perceived insecurity.
Social media and the web	We expect cybercriminals to continue their effective mass generation of malware, increasing the number of attacks using new social media platforms and integrated apps
Casual users causes	A casual shift to use of consumer devices without appropriate controls will cause backsliding in security capabilities.
Unknown profiles	Versions of software, code updates, security practices, vulnerability profiles, intrusion attempts, and security design, are all important factors for estimating your company's security posture.

Table 3.1 The security risks of cloud computing.

4. Cloud or web Future Forecast and assumption

Today people's concern about worldwide web security, according to IDC [16] the worldwide Web security market is estimated to grow from \$1.7 billion in 2010 to \$3.0 billion in 2015, constituting a 12.1% compound annual growth rate (CAGR). Web security SaaS will be the quickest - development segment of the Web security market. Web security SaaS will grow from \$239.6 million in 2010 to \$660.2 million in 2015, representing a 22.5% compound annual growth rate. Web security appliances will be the second-fastest-growing segment of the

Web security market. Web security appliances will grow from \$554.9 million in 2010 to \$1.3 billion in 2015, representing a 17.8% CAGR. Table 3 shows the worldwide web security Revenue platform 2009 to 2015 (\$ M)[15].

	2009	2010	2011	2012	2013	2014	2015	2010 Share	2015 Share	2010–2015
Software	911.5	898.3	942.3	978.8	1,012.1	1,043.4	1,074.2	53.1	35.9	3.6
Appliance	443.1	554.9	677.0	812.4	958.6	1,112.0	1,256.5	32.8	42.0	17.8
Software as a service	162.2	239.6	297.5	384.1	473.3	563.2	660.2	14.2	22.1	22.5
Total	1,516.8	1,692.8	1,916.8	2,175.3	2,444.0	2,718.6	2,990.9	100.0	100.0	12.1

Table 4.1 shows the worldwide web security Revenue platform 2009 to 2015 (\$ M).

5. Conclusion and future work

In this paper, we present a comprehensive analysis of cloud computing. We find the cloud concepts and try to demonstrate the cloud landscape vendors, growth of cloud computing, user concern about cloud security and worldwide web security revenue 2009 to 2015.

Cloud computing has a very fast pace of development in the current world scenario, public cloud, private cloud, hybrid cloud and community cloud are more popular today in terms of store and transfer data, cloud computing storage services for medium and high usage places. Public cloud storage can have of the order of the four to five times more possession of controlling influence than private cloud storage due to the increased energy consumption in transport. SaaS is works as the basis of “on-demand software” this is application based. PaaS is the based on ripped hardware, operating system, and storage and network's capacity over the internet. IaaS this model provided considered infrastructure as a service. The cloud computing is associated to lots of areas of information Technology, information management and services. The data security issue becomes more prominent than the traditional networks, because the data from the cloud computing environment is travels and dependent on the internet. Consumer not want to shared data on the platform of cloud. Today privacy and security are a core problem of cloud computing. The cloud computing security needs to think about in a particular way both technology and strategy, including audit, compliance, risk appraisal and feedback information. We try to find the effective solution of those issues.

REFERENCES

- [1]. D. Kondo, B. Javadi, P. Malecot, F. Cappello, and D. P. Anderson, BCost-benefit analysis of cloud computing versus desktop grids, in Proc. IEEE Int. Symp. Parallel Distrib. Process., Rome, Italy, May 2009, DOI: 10.1109/IPDPS. 2009.5160911.
- [2]. R. Buyya, C. S. Yeo, and S. Venugopal, BMarket-oriented cloud computing: Vision, hype, and reality for delivering IT services as computing utilities, in Proc. 10th IEEE Int. Conf. High Performance Comput. Commun., Dalian, China, Sep. 2008, pp. 5–13.
- [3]. A. Weiss, BComputing in the clouds, netWorker, vol. 11, no. 4, pp. 16–25, 2007. [4] B. Hayes, BCloud computing, Commun. ACM, vol. 51, no. 7, pp. 9–11, 2008.

[4] Phil Hochmuth, IDC , Worldwide Web security 2011-2015 forecast and 2010 Vendor shares: Form surfing Police to Strategic security platform.

[5] All Covered, " Types of cloud computing", <http://www.allcovered.com/pdf/Types-of-Cloud-Computing.pdf>

[6] Winkler, Vic (2011). Securing the Cloud: Cloud Computer Security Techniques and Tactics. Waltham, MA USA: Elsevier. p. 60. ISBN 978-1-59749-592-9.

[7] L.M Vaquero, L. Rodero-Merino, J.Caceres, and M. Lindner, " A Break in the cloud: towards a clod definition,"sigcomm comput. Commun. Rev, vol. 39, no 1, pp. 50-55, 2009

[8] "Software as a Service (SaaS)". Cloud Taxonomy. Retrieved 24 April 2011. <http://cloudtaxonomy.opencrowd.com/taxonomy/software-as-a-service/>

[9] Pring et al., "Forecast: Sizing the cloud; understanding the oppurtunities in cloud services," Gartner Inc., Tech. Rep. G00166525, March 2009

[10] techarda, "Cloud-computing landscape" ;<http://techarda.com/software/categories/cloud-computing/landscape>

[11] Gartner, "Cloud Computing: Benefits - Economic Growth", SIIA, <http://www.siiia.com>

[12] Resent IDC research , <http://www.idc.com>

[13] Etro F (2011) The Economics of Cloud Computing