

# ANALYSIS OF CLOUD SECURITY ISSUES AND CHALLENGES IN MEDIUM SCALE ENTERPRISES IN PAKISTAN

**Mobeen Ahmad**

Department of Computer Science, University of Agriculture, Faisalabad  
Mobeen.mughal623@gmail.com

**ABSTRACT:** Cloud computing is a capable circulated system to perform perplexing and huge size processing. By using Cloud computing sharing data via internet and also using for data backups with its many advantages like flexibility, efficiency, scalability, cost saving and proven delivery platform. Cloud computing service customers can transfer their information on cloud and can access whenever from wherever. There are no. of cloud clients that are utilizing cloud services to store their own information on cloud that why stockpiling security is required on capacity media. The fundamental worry of cloud computing is security amid transfer the information on cloud storage. Data security in cloud computing is major challenge that faced by cloud computing service users and as well as cloud computing service providers. In this paper, talked about complete review on essential examiners about cloud computing and also investigation of security issues and difficulties. Motivation behind this exploration is to highlight the present circumstance of Cloud Computing. Article attempts to answer the question "Is Cloud Computing safe ?". For noting questions required an analysis of security issues and difficulties in cloud computing. A survey was conducted for collection of response from different respondents. Analysis was conducted on bases of responses from different respondents, we draw conclusion that cloud computing is safe for medium scale enterprises in Pakistan.

**Keywords:** Cloud Computing, Security Issues, Analysis.

## 1. INTRODUCTION

User can store data on the cloud that is accessible over internet. In cloud computing hardware and software provided by the data center. These services are providing through the internet. Cloud computing provided multiple virtual servers for storage facility to its customers. Cloud infrastructure provided by Cloud computing service providers. Users have no need to worry about maintenance and physical security of cloud infrastructure. Consumers of the cloud computing need to sign the service level agreements with cloud service providers [13].

In cloud is a risk of data theft by thieves or employees of service providers. The thieves breaking into servers of service providers and by customers use the same services in sufficient split-up of dissimilar user's data from servers. Local governments of those states where data stored, these states have legal rights to view data in some critical conditions [10]. Also a risk in cloud computing that the data might be put to unauthorized customers. Currently there is no technical hurdle to such secondary uses. Cloud computing service providers gain the revenue from legal secondary uses of data of users. But, some this type of data uses would be unwanted to data owner.

Cloud is a larger sized infrastructure which provided virtualized pool of resources. Every one of the services that are given to the cloud computing service consumers in term of virtualization. There are different types of software [12] that are using to create virtualized environment. So it can be simply determined that according to user's demands and existing workloads, the facilities of cloud computing might be scaled dynamically. There are many resources that are used; these resources are measured for payment that is made on the basis of those measured resources.

The information proprietors can transfer their information in the cloud after consent to service level arrangements. These agreements are sign by service consumers with cloud service providers. For access data from cloud, the data user send request to data owner. Data owner provide response against the request of data user, then data user can download data

form cloud. There are many service providers and every service providers have different procedure of upload and retrieve data into cloud. Many organizations and peoples obstructed the use the cloud storage due to its security concern because in the cloud, user's data store through internet [1].

## 2. CLOUD SECURITY ISSUES AND CHALLENGES

There are many new attacks are generated due to utilization of cloud computing, all conventional correspondence frameworks are moving to the cloud that is a security concern. There are many authorization and authentication applications that are using in cloud environment, these authorization and authentication applications may must be changed. The services that are giving by the cloud benefit suppliers [3] is a noteworthy concern because many service consumers are affected when the services by cloud providers are deactivated. Each one of the customers in similar physical server can be affected by the deal of a virtual machine. Therefore, customary security concerns should be reevaluated from various edges by cloud suppliers.

### 2.1 Multi-Tenancy Issue

The across the board usage of distributed computing and the unstable method for the information set away by the customers in the cloud can make another pickle. Securing customer data against unapproved access from other individuals who run their methodology on similar physical servers can speak to an issue. Truth is told this situation is not another issue, checking the present worries with web facilitating administrations which likewise should be considered genuinely [15].

### 2.2 Cloud Standards

Accomplishing interoperability among mists and expanding their steadiness and security are vital equipment's offered by cloud measures [11]. Along these lines, distinctive principles creating associations need diverse benchmarks. Case in point, the current stockpiling administrations by a cloud supplier.

### **2.3 Data Security**

Information Security alludes as a classification, uprightness and accessibility. These are the huge issues for cloud vendors. Classification is characterized as a security of information. Privacy is intended to keep the touchy data from unapproved or wrong individuals. Honesty is characterized as the accuracy of information, there is no normal strategies exist for endorsed information trades. Accessibility is characterized as information is accessible on time [9].

### **2.4 Data Locations**

Truth be told, they won't not comprehend what nation it will be put away in [14]. Administration suppliers should be asked whether they will perform to putting away and modify information specifically intervention and on the premise of their clients will they make a reasonable achievement to take after neighborhood protection prerequisite.

### **2.5 Privileged User Access**

Exactly when customers utilize, they apparently won't know correctly where their data will encouraged.

### **2.6 Trust Issue**

Trust is also an imperative issue in disseminated processing. Trust can be amidst human to machine, machine to human, human to human, machine to human. Trust is turning around confirmation and assurance. In circulated figuring, customer stores their data on dispersed stockpiling as an aftereffect of trust on cloud. For example, people utilize Gmail server, Yahoo server since they trust on provider.

### **2.7 Data Recovery**

It is characterized as the way toward reestablishing information that has been lost, adulterated or mishap [7].

### **2.8 Unauthorized Secondary Usage**

One of the dangers can happen if the data is put for unlawful employments. Distributed computing standard plan [8] of action tells that the administration supplier can accomplish benefits from approved optional employments of clients' information, generally the focusing of plugs. Presently days there are no innovative hindrances for auxiliary employments. Moreover, it has the associated issue of monetary adaptability of the CSPs: for instance, plausibility of the end, and if distributed computing supplier is bankrupted or another organization get information then what might happen.

### **2.9 Control over Data Lifecycle**

To guarantee the client that it has control over information, on the off chance that it expel or erase information seller can't recover this information. In cloud IAAS and PAAS models virtual machine is utilized that procedure and after that media wiped yet at the same time there is no surety that next client can't get that information.

### **2.10 Availability and Backup**

There is no any surety of accessibility and go down of information in this environment. In business reinforcement is one of the essential thought [5].

### **2.11 Audit**

To execute inside checking control CSP need outer review system .But still cloud neglects to give evaluating of the exchange without affecting trustworthiness.

### **2.12 Trust**

Trust is extremely vital angle in business. Still cloud is neglected to make trust amongst client and supplier. So the

seller utilizes this superb application ought to make trust. Weak trust relationship and absence of client trust caused numerous issues amid sending of cloud administrations [4].

### **2.13 Mitigation Steps**

This segment incorporates moderation steps and some answer for conquer the issues talked about in past segment. It gives rules to the organizations that offer cloud administrations .It will be accommodating to them to make the appropriate methodology before actualizing cloud administrations. There are a few mitigations to lessen the impact of security, trust and protection issue in cloud environment. There are numerous reception issues like client gain benefit to power information [6] cause low exchange execution, organizations are concerned from digital wrongdoings and as Pakistan is presently going to grew so the Internet speed likewise impact the execution, virtual machines are taking milliseconds to encode information which is not adequate and to evade hazard there is contract between gatherings to get to information.

## **3. REVIEW OF CLOUD**

### **3.1 Cloud Services Models**

#### **3.1.1 Cloud Infrastructure as a service (IaaS)**

In this association of executed environment for their system a provider must be supply another figuring resource which consolidate stacking taking care of unit. Client has adaptable to finish and switches an item damaged to be completed and change between different applications like working structure and so forth.

#### **3.1.2 Cloud Platform as a Service (PaaS)**

This item supplies client with the ability to set up and created applications that are basically arranged on apparatus and programming tongues progressed by the providers. In this the client has no influence over the unmistakable affiliation yet has direction over the increased applications. Instance of this class of organizations joins Google App Engine, Windows Azure Platform and rack space.

#### **3.1.3 Cloud Software as a Service (SaaS)**

This item supplies the ability to use the machines which executed on cloud affiliation. With the usage of standard interfaces like web program or on the web (email) client, these mechanical assemblies are reachable. SaaS mechanical assemblies are obtained from different contraptions like convenient, workstation from wherever at whatever point.

#### **3.1.4 Cloud Network as a Service (NaaS)**

NaaS gives the ability to utilize the system benefits and between cloud system availability services. Change of ownership distribution services incorporate into perspective of system and figuring assets. These sort of administrations included extensible, upgraded virtual private system [2].

### **3.2 Cloud Deployment Models**

#### **3.2.1 Open Cloud**

Open cloud depicts the standard significance of disseminated processing that is accessible, effective ways and means, which are open on web from a minor social occasion, which kept assets and charges its clients on the introduce of utility. Cloud affiliation is had and wrap up by a provider who prescribe its retune to open range. E.g. Google, Amazon, Microsoft offers cloud organizations by method for Internet.

### 3.2.2 Private Cloud

Private cloud is a term used to give an exclusive processing design provisioned services on corporate systems. Huge ventures typically utilized this sort of cloud computing to allow their private system and data Center executives to viably get to be in-house 'service suppliers' taking into account clients inside the partnership. Cloud association is building up for a specific collection and oversaw by an outsider under an administration level understanding. Just single association wanted to work by means of corporate cloud.

### 3.2.3 Cross breed Cloud

A half and half cloud contain resources from both corporate and open suppliers will turn into the requested decision for undertakings. The half breed cloud is a mix of both corporate cloud and open cloud. For instance, for general figuring endeavor could choose to make utilization of outer services what's more, its own particular server farm's includes its own information Centre's.

## 4. MATERIAL SND METHODS

There are many security concerns in cloud computing. The research work was conducted on the cloud computing. In this research, different questions have been asked by multiple cloud provider companies and cloud service consumers. Questions have been conducted in which 27 questions were relevant to cloud service providers and 24 questions were about cloud service consumers. These questions were like multiple choice, some of these questions were like in which respondent could only chose 1 option and other questions were those in which respondent could chose more than 1 options. There were 25 respondents from cloud service providers and also 25 respondents from cloud service consumers. Survey is conducted from multiple service provider companies. These are Webanchor.net, Comsats Internet Services, Fast Services, Cyber Internet Services and Wateen. And also there were multiple service consumer companies from which survey was conducted. These are Interloop Ltd, Habib Bank Ltd, University of Agriculture, Faisalabad. All Information that was get through this survey, entered in statistical tool SPSS. Relationship between questions was checked by applying chi-square test and results obtained from the basis of this test are explained in result and discussion section.

## 5. RESULTS AND DISCUSSION

**Hypothesis 1:** What is more secure and assure the safety of stored data.

**Table:** Association between what is more secure and assure the safety of stored data.

### Chi-Square Tests

|                              | Value               | df | Asymp. Sig. (2-sided) |
|------------------------------|---------------------|----|-----------------------|
| Pearson Chi-Square           | 25.000 <sup>a</sup> | 2  | .000                  |
| Likelihood Ratio             | 8.397               | 2  | .015                  |
| Linear-by-Linear Association | 5.860               | 1  | .015                  |
| N of Valid Cases             | 25                  |    |                       |

Chi-Square = 25.00

P-Value = .000

The above table represents an association between what is more secure and assure the safety of stored data. Chi square value shows a significant association between them. So the hypothesis "What is more secure and assure the safety of stored data" is accepted.

**Hypothesis 2:** You imply controls to segregate consumer data from other customers and as a whole you are satisfied with the services of cloud computing consistency.

**Table:** Association between you imply controls to segregate consumer data from other customers and as a whole you are satisfied with the services of cloud computing consistency.

### Chi-Square Tests

|                              | Value              | df | Asymp. Sig. (2-sided) |
|------------------------------|--------------------|----|-----------------------|
| Pearson Chi-Square           | 8.165 <sup>a</sup> | 3  | .043                  |
| Likelihood Ratio             | 5.788              | 3  | .122                  |
| Linear-by-Linear Association | 3.636              | 1  | .057                  |
| N of Valid Cases             | 25                 |    |                       |

Chi-Square = 8.16

P-Value = .043

The above table represents an associations between you imply controls to segregate consumer data from other customers and as a whole you are satisfied with the services of cloud computing consistency. Chi square value shows a significant association between them. So the hypothesis "You imply controls to segregate consumer data from other customers and as a whole you are satisfied with the services of cloud computing consistency" is accepted.

**Hypothesis 3:** Cloud computing that you are providing is user friendly and all cloud services that you are offering are efficient.

**Table:** Association between cloud computing that you are providing is user friendly and all cloud services that you are offering are efficient.

### Chi-Square Tests

|                              | Value               | df | Asymp. Sig. (2-sided) |
|------------------------------|---------------------|----|-----------------------|
| Pearson Chi-Square           | 27.646 <sup>a</sup> | 6  | .000                  |
| Likelihood Ratio             | 25.829              | 6  | .000                  |
| Linear-by-Linear Association | 9.755               | 1  | .002                  |
| N of Valid Cases             | 25                  |    |                       |

Chi-Square = 27.64

P-Value = .000

The above table represents a association between cloud computing that you are providing is user friendly and all cloud services that you are offering are efficient. Chi square value shows a significant association between them. So the hypothesis "Cloud computing that you are providing is user friendly and all cloud services that you are offering are efficient" is accepted.

**Hypothesis 4:** It is safe to store personal data in the cloud and security professionals should warn against cloud computing.

**Table:** Association between it is safe to store personal data in the cloud and security professionals should warn against cloud computing.

#### Chi-Square Tests

|                              | Value               | df | Asymp. Sig. (2-sided) |
|------------------------------|---------------------|----|-----------------------|
| Pearson Chi-Square           | 32.117 <sup>a</sup> | 16 | .010                  |
| Likelihood Ratio             | 16.829              | 16 | .397                  |
| Linear-by-Linear Association | .544                | 1  | .461                  |
| N of Valid Cases             | 25                  |    |                       |

Chi-Square = 32.11

P-Value = .010

The above table represents an association between it is safe to store personal data in the cloud and security professionals should warn against cloud computing. Chi square value shows a significant association between them. So the hypothesis "It is safe to store personal data in the cloud and security professionals should warn against cloud computing" is accepted.

**Hypothesis 5:** How secure is cloud computing and cloud is for governments.

**Table:** Association between how secure is cloud computing and cloud computing is for governments.

#### Chi-Square Tests

|                              | Value               | df | Asymp. Sig. (2-sided) |
|------------------------------|---------------------|----|-----------------------|
| Pearson Chi-Square           | 24.030 <sup>a</sup> | 6  | .001                  |
| Likelihood Ratio             | 20.861              | 6  | .002                  |
| Linear-by-Linear Association | .150                | 1  | .699                  |
| N of Valid Cases             | 25                  |    |                       |

Chi-Square = 24.03

P-Value = .001

The above table represents an association between how secure is cloud computing and cloud computing is for governments. Chi square value shows a significant association between them. So the hypothesis "How secure is cloud computing and cloud computing is for governments" is accepted.

**Hypothesis 6:** Cloud computing is easy to use and user friendly.

**Table:** Association between cloud computing is easy to use and user friendly.

#### Chi-Square Tests

|                              | Value               | df | Asymp. Sig. (2-sided) |
|------------------------------|---------------------|----|-----------------------|
| Pearson Chi-Square           | 21.271 <sup>a</sup> | 6  | .002                  |
| Likelihood Ratio             | 19.860              | 6  | .003                  |
| Linear-by-Linear Association | 7.587               | 1  | .006                  |
| N of Valid Cases             | 25                  |    |                       |

Chi-Square = 21.27

P-Value = .002

The above table represents an association between cloud computing is easy to use and user friendly. Chi square value shows a significant association between them. So the hypothesis "Cloud computing is easy to use and user friendly" is accepted.

**Hypothesis 7:** Overall, you are satisfied with the cloud computing reliability and based on your experience with cloud computing, you will buy cloud computing again.

**Table:** Association between overall, you are satisfied with the cloud computing reliability and based on your experience with cloud computing, you will buy cloud computing again.

#### Chi-Square Tests

|                              | Value               | Df | Asymp. Sig. (2-sided) |
|------------------------------|---------------------|----|-----------------------|
| Pearson Chi-Square           | 17.917 <sup>a</sup> | 6  | .006                  |
| Likelihood Ratio             | 16.468              | 6  | .011                  |
| Linear-by-Linear Association | 10.054              | 1  | .002                  |
| N of Valid Cases             | 25                  |    |                       |

Chi-Square = 17.91

P-Value = .006

The above table represents an association between overall, you are satisfied with the cloud computing reliability and based on your experience with cloud computing, you will buy cloud computing again. Chi square value shows a significant association between them. So the hypothesis "Overall, you are satisfied with the cloud computing reliability and based on your experience with cloud computing, you will buy cloud computing again" is accepted.

## 6. CONCLUSION

Cloud computing is very famous and popular technology that is using now days for data backups and other multiple advantages. There are many benefits of cloud computing but it has drawback for security issues. Research work conducted on security issues on cloud computing. A survey was conducted, the results of this survey shown and shared in result and discussions section. Chi-Square test was used for the checking association between these questions. Above materials in result and discussion shows that cloud computing is safe, user friendly, easy to use and best for medium scale enterprises in Pakistan.

## REFERENCES

- [1] Chen, D. & Zhao, H. (2012, March). Data security and privacy protection issues in cloud computing. In *Computer Science and Electronics Engineering (ICCSEE), 2012 International Conference on* (Vol. 1, pp. 647-651). IEEE.
- [2] Hu, F., Qiu, M., Li, J., Grant, T., Taylor, D., McCaleb, S., ... & Hamner, R. 2011. A review on cloud computing: Design challenges in architecture and security. *CIT. Journal of Computing and Information Technology*, **19**(1): 25-55.
- [3] Abd, S. K., Al-Haddad, S. R., Hashim, F. & Abdullah, A. (2014, August). A review of cloud security based on cryptographic mechanisms. In *Biometrics and Security Technologies (ISBAST), 2014 International Symposium on* (pp. 106-111). IEEE.

- [4] Hashizume, K., Rosado, D. G., Fernández-Medina, E. & Fernandez, E. B. 2013. An analysis of security issues for cloud computing. *Journal of Internet Services and Applications*, **4**(1): 1.
- [5] Choo, K. K. R. 2014. Legal issues in the cloud. *IEEE Cloud Computing*, **1**(1): 94-96.
- [6] Harfoushi, O., Alfawwaz, B., Ghatasheh, N. A., Obiedat, R., Mua'ad, M. & Faris, H. 2014. Data Security Issues and Challenges in Cloud Computing: A Conceptual Analysis and Review. *Communications and Network*, **2014**, **6**(1): 15-21.
- [7] Kaur, R. & Kaur, J. (2015, March). Cloud computing security issues and its solution: A review. In *Computing for Sustainable Global Development (INDIACom), 2015 2nd International Conference on* (pp. 1198-1200). IEEE.
- [8] Narula, S. & Jain, A. (2015, February). Cloud Computing Security: Amazon Web Service. In *2015 Fifth International Conference on Advanced Computing & Communication Technologies* (pp. 501-505). IEEE.
- [9] Yang, J. & Chen, Z. (2010, December). Cloud computing research and security issues. In *Computational intelligence and software engineering (CiSE), 2010 international conference on* (pp. 1-3). IEEE.
- [10] Pearson, S., Shen, Y. & Mowbray, M. (2009, December). A privacy manager for cloud computing. In *IEEE International Conference on Cloud Computing* (pp. 90-106). Springer Berlin Heidelberg.
- [11] Yang, J. & Chen, Z. (2010, December). Cloud computing research and security issues. In *Computational intelligence and software engineering (CiSE), 2010 international conference on* (pp. 1-3). IEEE.
- [12] Singh, H. 2015. A Review of Cloud Computing Security Issues. *International Journal of Education and Management Engineering (IJEME)*, **5**(5): 32.
- [13] Varghese, S. & Vigila, S. M. C. (2015, April). A comparative analysis on cloud data security. In *Communication Technologies (GCCT), 2015 Global Conference on* (pp. 507-510). IEEE.
- [14] Lin, F. T. & Shih, T. S. 2010. Cloud computing: the emerging computing technology. *J ICIC Int*, **1**, 33-38.
- [15] Jensen, M., Schwenk, J., Gruschka, N. & Iacono, L. L. (2009, September). On technical security issues in cloud computing. In *2009 IEEE International Conference on Cloud Computing* (pp. 109-116). IEEE