Abstract- Cloud computing is emerged as new technology in organization and cooperates. To successfully provide cloud services and sharing of resources, the cloud must be tested before came into service. Cloud testing is a form of testing in which web applications uses cloud computing environment and infrastructure to simulate real world user traffic by using cloud technologies and solutions. The Cloud computing gives the way to obtain computing resources, and also provide a new direction to manage and deliver computing solutions, technologies, and services. Every New technology have lots of challenges attached with it. Similarly Cloud-based testing also provides a set of challenges, such as lack of standards and data security, especially in the public cloud model. Cloud computing provides an opportunity to offer testing as a service (TaaS) for clouds and Saas. Cloud computing also identify new challenges, issues and needs in software testing, generally in cloud-based applications and testing clouds. This paper focuses on testing challenges of the cloud that is being faced by cloud service provider. It also examines the major needs, challenges, and issues in testing cloud-based software applications.


I INTRODUCTION

Cloud computing changes the way of computation and services to customers which received significant attention. For example, it changes the way of managing computing resources, such as databases, CPUs and storage systems. The concept of cloud built upon the three such as Infrastructure, Platform and the Software. The cloud provide the business benefit of “On demand Service” which full fill the demand of chain execution. Cloud also provides “Reliability” and “Scalability” for the applications that are either deployed or running on cloud. Organizations are finding it difficult to execute test cases and monitor performance of a new breed of cloud applications. Leverage cloud testing to augment traditional practices and open the door to a higher level of software testing [1].

II BACKGROUND: SOFTWARE TESTING ON CLOUD

As cloud computing [2] came into the depiction, a new perception of testing on cloud has evolved, though not many companies have flung into it. Software testing is an indispensable and significant stage of the software development process because testing Software is just more than debugging a Software. The vital purpose of testing any software can be quality declaration, verification and validation, or trustworthiness evaluation. Thus, cloud computing is a model or platform on which testing must be conceded out just like any other service.

Testing necessitate exclusive dedicated infrastructure [3] and possessions that were only used intermittently which carefully examine the application’s performance, dependability, swiftness, security and functionality. In view of the fact that, business applications are rising day by day in complexity, so it is a tedious job for an Organizations to put up and maintain in-house testing amenities that imitate real-time environments.
Cloud testing [4] is the respond to the less-than-pragmatic performance test that commences within the infrastructure of one of our clients. While using cloud testing, an advantage is to be taken of hardware and bandwidth that more strictly impersonate our practical, factual world scenarios. Basically, individual can implement the test in cloud-based infrastructure and bandwidth."

As each and every one is sentient of the actuality that in accustomed circumstances testing of a product is done excellently within the association by the quality/test teams Firstly ,To assure the quality of cloud-based [5] deployed in a cloud, including their functional services, Secondly ,To validate SaaS i.e. Software as a Service (SaaS) in a cloud environment, including software performance, scalability, security, thirdly To test cloud concord and inter-operation competence between SaaS and applications in a cloud infrastructure, for example, checking the APIs of SaaS and their cloud association to others, fourthly, To test out the present automatic cloud-based well-designed services, for example auto-provisioned functions.

### III Testing Challenges

| Service Challenge   | • Service Availability  
|                     | • Service Assurance     
|                     | • Service Efficiency    |
| Security Challenge  | • Confidential Data Security  
|                     | • Depending on Customer data  
|                     | • Meeting Security Requirements  |
| Layered Testing Challenge | • Three layers testing Protocol  
|                     | • Communication between Layers  |
| Lack of Universal Standard and Infrastructure  | • Limited Technology configuration  
|                     | • Limited servers and storage infrastructure  
|                     | • Insufficient self measurement  
|                     | • Virtualization  |
| Guidance, Knowledge and Staff Expertise  | • Obtaining Guidance  
|                     | • Expertise Teaching Staff  
|                     | • Acquiring Direct Knowledge  |
| Procuring Cloud Service on-Demand Basis  | • Define Specific Quantity and Costs  
|                     | • Dependency on Remote Installed Applications  
|                     | • Increasing Expenditure on Encrypted Data  |
| Other’s Challenges  | • Building of Test Environment  
|                     | • Accessing Vendors which meets Standards  
|                     | • Ensuring Data Resilience and Inter operability  
|                     | • Proper Utilization of Cloud Resources  |

**Figure 2: Challenges in testing of Cloud Application[2]**

### IV Issues, Controversies, Problems: Cloud Service Challenges

To effective perform cloud testing, it is very important to understand the primary issues, potential challenges and needs. One of the most important challenge [6] in cloud computing is the cloud service. The first challenge is service availability. Actually Cloud service is appear as local services rather than remote services. Another challenge is the cloud service assurance. The cloud services provider assure delivery of cloud service and also controls data communication connection between corporate users as well as cloud service timely. Service efficiency is also a challenge in Cloud Service. It basically encompasses efficiency in all the aspects i.e. from cost savings, power and space efficiency to scalable as well as efficient cloud service delivery using high end servers, virtualization and high speed interfaces [7].

On-demand testing issues and challenges -software testing services must be controlled and managed based on on-demand testing requests. This kind of new testing service model raised several issues and challenges [8].

- What is the automatic test process for Testing as a Service (TaaS) to support on-demand automation testing?
- What are the well-defined cost models for testing as a service?
- What are the intelligent approaches to coping with the failures of software testing scripts
- Test cases in an on-demand testing process?

### V Solutions and Recommendations: Issues & Challenges of Cloud Testing

#### Privacy

- A privacy issue is a very difficult job and necessary to achieve in cloud environment as data may be moved to data center’s which are located in many different countries and locations
- So an approach must be developed by customers and service providers to ensure the data is collected, stored, accessed and managed in conformity of applicable privacy laws [9].

#### RASP Testing: (Reliability, Availability, Scalability and Performance)

- The first two might be fairly the duty of the vendor from an infrastructure view but the reality is that it’s our duty to keep a check on all four from an architecture view.
• Numbers of structural decisions that need to be taken care when designing an application infrastructure and choose the right one [10]. Testing Security and measurement in cloud
• The security issue [12] is a critical one because a security failure might cause significant damage to customer's private data, information and among other things.
• The provider should monitor security checks and audit of security procedures and ensure security of consumer information.
• Cloud services [13] provider will employ data storage and data encryption, consumer verification, and data access practices.
• About the exposure of data to hackers, thieves and outside world, one solution for it is to have a hybrid deployment model, where data is protected by firewall.

Data Recovery for testing
• Cloud service providers use regular data backup processes as well as redundant servers.
• But some of the people are worry about their data whether they are able to control their data backups on their own or not.

Regression testing issues
• Regression testing [14] means testing for changes or we can say they we do Re-test of specific version.

VI CONCLUSION

This paper is based on testing challenges of the cloud that is being faced by cloud service provider. It also examines the major needs, challenges, and issues in testing cloud-based software applications. It includes various types of testing involved in the same and apart from also address the challenges caused by software frequent changes and Bug Fixing. So, this paper focus on testing challenges of the cloud that is being faced by service provider.

REFERENCES
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