An Approach to Study Cloud Based Testing and Techniques

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Abstract - **Cloud provides with the techniques of managing and delivering computer services, technique, storage facility and solutions. Cloud testing, a software testing on web and mobile environment uses the cloud environment. Cloud-testing imposes cloud computing resources and models to enable all aspects of load testing, performance testing and stress testing in a highly cost effective manner. In this paper, testing is identified in three areas of cloud they are infrastructure, Platform and service. We discuss about cloud based testing and the impact of performance in cloud computing.**

IndexTerms - Cloud Computing, Cloud Testing, Cloud Infrastructure

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I. INTRODUCTION

Cloud computing changes the way of storage and services provided to customers which received significant notices. Cloud changes the way of storing the data into different locations such as CPUs, database, and storage system. Cloud creates a backup of the stored applications and increases the similar outputs of the resources. Cloud testing is a difficult way to check the performance of the web application. As we know in private or in public sector the testing of the software is critically a cost efficient method [6]. Through this we calculate the Minimum, Maximum and Average parameters visit of the site and calculate the presence of error in site. Cloud testing is similar as the software testing in which cloud is tested under the cloud Infrastructure. Through cloud we check the performance, speed, consistency, functionality, security, and their utilization.

II. CLOUD TESTING

Cloud testing can be defined as "Testing as a service" which deals with testing of resources and services are make use of Cloud Infrastructure may be in Horizontal streams either in Vertical Tower are making use of cloud based licensing model for their end user clients. This includes functional as well as non functional testing of various web or mobile applications. Cloud testing is similar as a software testing. Two types of cloud testing services-1) On-demand 2) On-premise [3] Testing of a cloud refers to verification and validation of a cloud services and their compatible with the environment of layers of cloud. The main objectives of cloud Testing are:-

- Maintain the scalability and quality of the cloud [5].
- Maintain the security of the cloud application.
- Validate the cloud application in software as a service [5].
- Ensures how many users are uses cloud technology at a time.
- Cost reduction during the testing process.

We use cloud Testing for the following purpose:-

- Cost reduction
- Load, Stress and Performance Testing is more realistic

III. TYPES OF CLOUD TESTING

- *Availability Testing-*
  Testing is used when the running application are available for a planned period of time, collecting errors events and repair it in the mean time and then compare it with the original service level running time [6].

- *Security Testing-*
  It is a type of non-functional testing. It is the process that determines the confidential data stays confidential and only authorized user can perform the specifically assigned tasks [7].

- *Mutation Testing-*
  Mutation Testing is an approach where the structure of the code is been used and the entire testing process is guided through it. A mutation is a small change in a program and the changes are then tested and processed.

- *Interoperability Testing-*
  This type of testing deals with interaction of one system with the other system. With interoperability testing, a software checks for its interaction with other system component [10].

- *Recovery Testing-*
  Recovery from disaster is difficult to perform. It takes maximum time when money is an issue. But in cloud backup is first created then recovery can be easily done.

- *Performance Testing-*
  It is the way to assure the Quality of the resources Testing used to monitoring and tuning of cloud. It refers to information regarding to your applications response time, throughput, and resource utilization levels.

- *Compatibility Testing-*
  It is the part of nonfunctional testing. It checks the compatibility of web resources with the computing resources.

- *Latency Testing-*
  It varies to check the error of one application from other application. It is not easy to measure the latency of the applications.

- *Consonance Testing-*
  It deals with the multiplicity problem; the classical approach is minimization of attention towards procedures that seize the error control. It corrects the multiple errors at one time.
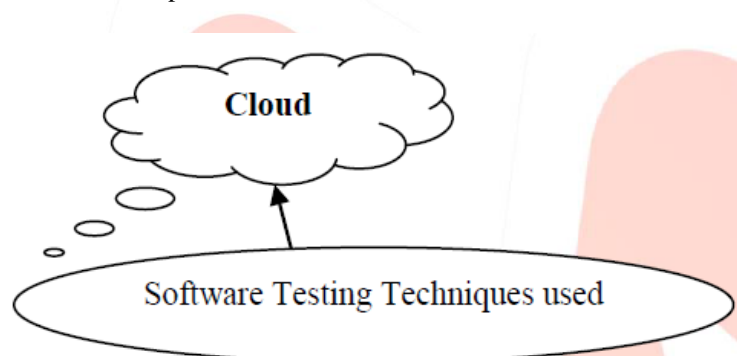

Fig 1 Testing in Cloud using the techniques of Software

IV. CLOUD TESTING AND ITS REQUIREMENTS

Testing non internet applications, firstly we required setup through which the applications can be easily compared from the online applications. The cloud testers provide the environment as per the application required [5]. The main key objectives for the cloud environment are:-
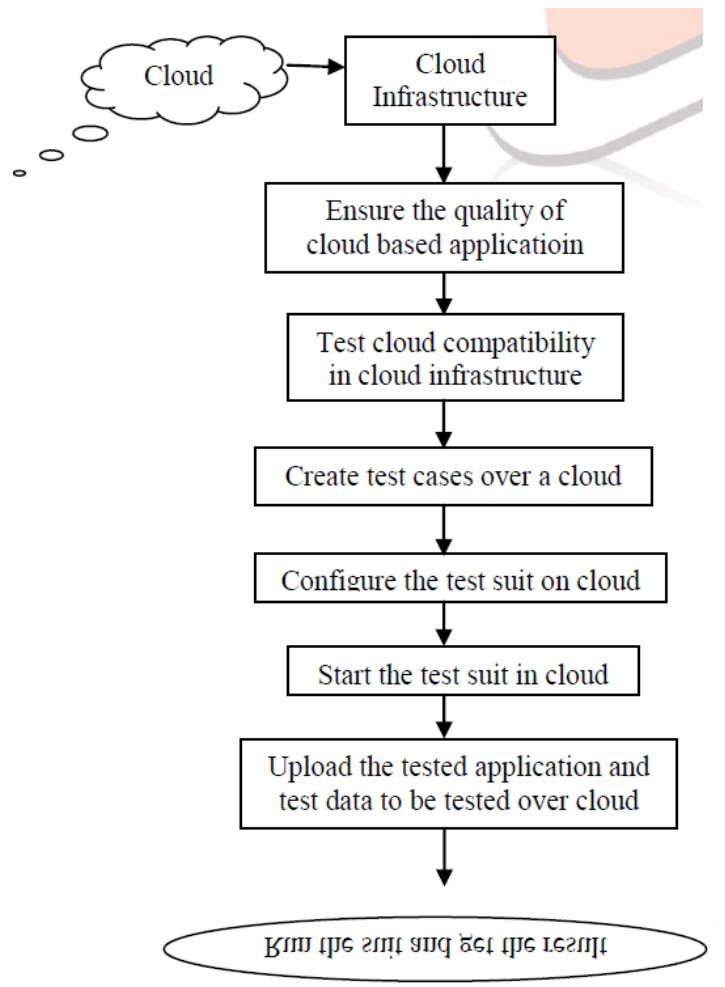
Fig 2 Requirements for cloud Testing

V. MODELS OF CLOUD TESTING

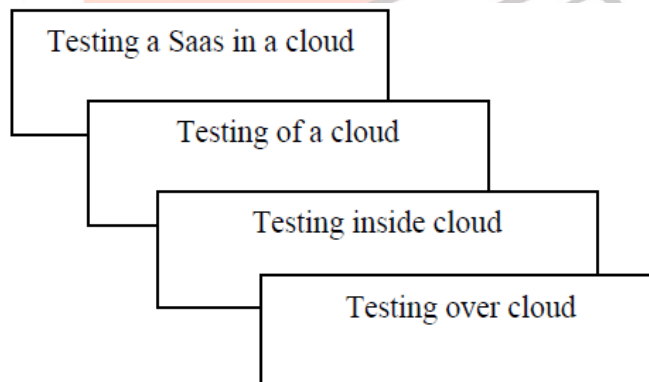Testing in a cloud has three layers [1] [3] [4] [10]:-

Fig 3 Testing model of cloud

Testing SaaS in cloud

It provides functional, non functional and test automation services in cloud. It is an externalize model in which Testing activities associated with some of an organization a business activities are performed in cloud infrastructure. [4]

Testing of a cloud

It provides a fatiguing or tiring process. The setup is done in a way that the Hardware, Software and further devices chosen support testing for the cloud infrastructure and then give the compatible result of the system. Tools like j- meter, the blaze meter platform and can be used for this purpose. [4] [12]

Testing inside cloud

The internal infrastructure of a cloud is checked for the quality and parametric views of the cloud. This helps to review the

specified cloud compatibility and functionality through which comparison among the cloud can be compared [12].

Testing outside cloud

Cloud-Based services test the applications of a cloud which includes the Deployment model of the cloud in which system requirements and specifications on system level are tested. It usually stores the cloud based applications of the models [12].

VI. ARCHITECTURE USED FOR CLOUD TESTING

Cloud computing is divided into two sections: - Front end and Back end.
- Frontend is a client side which uses all types of cloud services.
- Backend is a network side which is used to connect client machine to the server having data for the execution. Testing is performed at the backend side of the cloud.

The Cloud system has centralized server to administrate the system client machine and to maintain the demand and cost. Once the test cases are developed, these tests cases undergo execution. After completing the intended execution, the cloud service providers are capable of providing the appropriate results and analytics to the IT cooperate world which further perform a complete analysis of the performance associated applications and internets result within a peak time interval.[7][9][12][14].

VII. BENEFITS OF CLOUD TESTING

Testing on a cloud has a number of benefits in terms of cost and resources. It is generally done on the basis of "service on demand" or "testing on demand" [7]. The cost is charged on the basis of usage of hardware, software, tools, testers etc. [7] [10] [11].

They also prefer other meaningful benefits [11]:-
- Support for complex application
- Real time testing
- Improved test quality
- No setup and procurement time wastage
- Flexibility and wide range
- Less management work
- Cost effective
- Change in the external environment
- Highly scalable
- Turned fixed cost into variable cost
- Reduction in capital expenditure

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