

# Cloud Computing Applications and their Testing Methodology

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**Abstract:** Cloud computing has opened up new open doors for testing offices. New innovation and social network patterns are making a flawless tempest of chance, empowering cloud to change inner operations, customer connections and industry quality chains. To guarantee high calibre of cloud applications being worked on, engineer must perform testing to look at the quality and precision whatever they plan. Business clients are attracted to cloud's rearranged, self-administration experience and new administration abilities. In this exploration paper, we address a testing natural construction modelling with important key advantages, to perform execution of experiments and utilized testing techniques to upgrade nature of cloud applications.

**Key Words:** Cloud, Cloud Testing, Testing, Cloud Applications, Test Cases, Cloud Infrastructure Environmental Architecture.

## I. INTRODUCTION

Cloud computing has become a new computing paradigm where the cloud could provide both virtualized hardware and software resources that hosted remotely and provide a use-on-demand service model. Cloud computing offered an ability to access shared resources and common infrastructure, which provide services on demand over the network to perform operations that meet changing business needs. It provides facilities for users to implement, deploy and manage their applications 'on the cloud' which entails virtualization of resources that preserves and accomplishes itself. Cloud testing uses cloud environmental architecture for software testing. Organizations pursuing general testing that carrying some challenges like limited test budget, meeting deadlines etc. To serve a quality product, testing is the last solution to any kind of problem we would face in future from customer site. Cloud testing is a form of software testing where in testing is done through using resources over cloud applications under the cloud infrastructure. This is where cloud testing has emerged as a fresh approach to testing where cloud computing environments are leveraged to simulate real world with application's performance, consistency, speed, security and functionality. [2]

As more and more people tend to use the cloud for application use, environment and infrastructure, the validation and verification of the proper workings of these services are necessary. According to IBM statistics, cloud services reached \$42 billion by the year of 2012 [2], and according to Gartner, cloud services will reach the \$150 billion by 2013 [2]. These huge numbers lead to see the necessity of testing and ensuring the conformity of these services that have been snowballing for the recent years. It became crucial to assure the quality of the business services being built and deployed in the cloud. To achieve this quality goal, testing is to the rescue. Either this testing of cloud offerings is done at the premise or over the cloud;

the techniques and leads to testing in cloud would stay the same. Testing in cloud will allow the users to mitigate the risks and errors when applications are deployed to the cloud. Besides, the use of cloud computing for testing means less costs and fewer expenditure. Now that testing the offerings of the cloud is compulsory, specific techniques, methods, and tools will need to be applied to this new type of testing. The conventional testing tools were not designed to test this complex and dynamic computing environment. An adaption of old techniques and tools needs to be performed in order to make these methods fit this different type of computing environment. At some point, new tools and methods should be introduced to test some specific offering of the cloud. In this paper, the focus is on testing methodologies for software as a service (SaaS); testing cloud application on demand (pay as you go).

To be able to describe these challenges, we define first need what the traditional security triad of confidentiality, availability, and integrity, means in the cloud computing context. All three factors of integrity, confidentiality, and availability, need to be carefully evaluated as applications and functionality are moved to the cloud. IT and cyber security professionals often replicate designs that they have used in the past. When cloud computing is being utilized, a cyber security requirements analysis and design using the methodology described in (NIST 2010; NIST 2011) must be performed. [4]

## II. EXISTING SYSTEM

Malicious media or devices may be inadvertently infiltrated inside the trusted perimeter by personnel. For example, USB memory sticks have become a popular tool to circumvent perimeter defences: a few stray USB sticks left in public spaces are picked up by employees and plugged into previously secure devices inside the trusted perimeter, enabling malware on the USB sticks to

immediately infect the devices. Similarly, devices used both inside and outside the trusted perimeter can get infected with malware when outside, and infiltrate that malware when used inside. Common examples are corporate laptops that are privately used at home over the weekend. [5]

Greek mythology for his ability to turn everything he touched into gold. This was called the Golden touch, or alternatively, the Midas touch — Robert Graves (1960). The primary goal of the STRG borrows an analogy from the idea of the MIDAS touch by encouraging students to share research ideas, methods, and critiques with each other while conducting research in related areas. One student can provide the golden touch for another, who in turn can pass it on. During the process, each individual becomes stronger, and the group becomes more effective in its mission. is becoming an increasingly integral part of many companies' business and technology strategy. Cloud services help companies turn IT resources into a flexible, elastic, and self-service set of resources that they can more easily manage and scale to support changing business needs. While many different delivery models for cloud computing services exist, two foundational services are a requirement for making cloud computing into a strategic part of an overall computing infrastructure. These include Infrastructure as a Service (IaaS) and Platform as a Service (PaaS). IaaS is the services that enable you to gain access to compute and storage resources in an on demand model. PaaS is the services that sit on top of IaaS and enable you to build applications to support the business.

Testing software requires enough resources and budget to complete it successfully. But most of the organizations face the challenges to provide enough resources to test their software in distributed environment, with different loading level. This leads to severe problem when the software deployed into different client environment and varying user load. Cloud computing is a one of the emerging technology which opens new door for software testing. This paper investigates the software testing in cloud platform which includes cloud testing models, recent research work, commercial tools and research issues.

### III. CLOUD TESTING & ITS REQUIREMENT

The cloud testing administration suppliers give crucial testing environment according to the necessity of the application under test. The genuine testing of uses is performed by the testing group of the association which possesses the application or outsider testing sellers. Organizations imagine genuine Web clients by utilizing cloud testing (A testing process that includes utilizing cloud assets) benefits that are given by cloud administration. The principle target behind cloud testing is:

1. To guarantee the nature of cloud-based applications sorted out in a cloud, with their practical comforts, business strategies and framework execution and in

addition adaptability in light of an arrangement of utilizations based necessities.

2. To test cloud similarity in cloud infrastructure. To run a suite of experiments over a cloud application you may need to perform taking after steps, for example, Create and design cloud PCs.
3. Upload tried applications and test information to be tried over the cloud. Run your tests and get test outcomes.

The whole process requires some investment and slip inclined, it might be entirely simple to run a few tests on cloud machines with robotization. Driving cloud suppliers and endeavors are actualizing server farms that are reason constructed for the cloud.

#### 1. Mathematical Model

We have to check the status of system to know system is overloaded or not because on the basis of status we are transferring the request to balance load. Finding Status of system we require Load degree so,

Input: Set of Parameters.

Output: 1. Load Degree

#### 2. Load Degree Average

Define a load Parameter Set:  $F = \{f_1, f_2, \dots, f_m\}$

$m =$  represent the total no. of parameters

Compute the load degree as:  $Load\_Degree(N) = \sum_{i=1}^m m \cdot i \alpha_i F_i$

Where  $i = 1 \dots m$

$F_i = (1 \leq i \leq m; F_i \in [0, 1])$

Average Cloud partitioning load Degree:

$Load\_Degree\_Avg = (\sum_{i=1}^m m \cdot i \alpha_i Load\_Degree(N_i)) / n$

#### Classify Load Input:

1. Load Degree.

2. Load Degree Average

Output: Status Information

• Idle

$Load\_Degree(n) = 0;$

• Normal

$0 < Load\_Degree(n) \leq Load\_Degreehigh$

• Overload

$Load\_Degreehigh \leq Load\_Degree(n)$

#### 2. Architecture Support For Cloud Testing

Distributed computing structural engineering, much the same as some other application or programming, is considered into two fundamental areas: Front End and Back End. Front end is a customer or any application which is utilizing cloud administrations. Back end is the system of customer machines with servers having PC project and information stockpiling framework. Cloud has unified server organization to administrate the frameworks customer, requests and so on. When client situations are created and the test is planned, and executed. When the test finished the cloud administration supplier convey results and scientific back to corporate IT experts through continuous dashboards for a complete examination of how their applications and the web will perform amid crest volumes.

Cloud testing is regularly seen as just execution or burden tests, be that as it may, as talked about prior it covers numerous different sorts of testing. Distributed computing itself is frequently alluded to as Software as a Service (SaaS) and utility processing. As to test execution, the product offered as an administration may be an exchange generator and the cloud supplier's foundation programming.

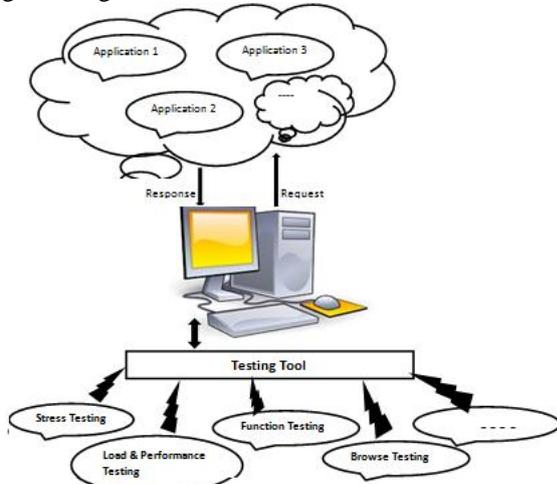


Fig 1 Attempt by hacker for the key

1. Stress Test - It might be choosing for overall performance testing, defines the capacity of application which highlighted describing an application's stability, relieve, and persistence under risk conditions. The reason for pressure testing would be to sustain application problems that demonstrated under risky problems. All these conditions primarily have thick loads, high concurrency or limited computational assets. The idea behind anxiety a system would be to decide on it to the cracking point to be able to determine insects. The method is not anticipated to method the overload without appropriate sources, however to act (e.g. Breakdown) in a basic way (e.g., not destructive or reducing data or damage). Stress tests usually need simulating one or numerous vital production circumstances within a number of chaotic conditions.

2. Load Test - It incredibly represents an application concerning getting of essential user visitors and gathering its reactions [12]. Application stableness is an important aspect as the user issue requires to be greater. There is also a necessity to tune the overall performance of any application to fulfill specific standards Accumulating reply time and separate claims regarding to particular measures whilst system is exposed to enhancing load from various places and multiple user actions. You must identify issues as the system is tested to shattering point highest anticipated capability or often beyond the anticipated usage. A software system potential can certainly be referred to as its functionality for the handle to manage system loads according to the allotted system resources. These system loads can easily be categorized into the user access load, Communication web traffic load, Data space connect with load.

3. Performance Test - it is rather typical to gather and determine system efficiency parameters of SaaS in a cloud for performance testing and investigation depends on the supplied QoS and SLA [10] [22]. A standard overall performance parameter set deals with the processing performance (for instance person reply valuable time), system usage, throughput, durability, and existence. To give assistance to the numerous necessity of overall performance analysis of numerous performance parameters, we employ a recognition chart as a System Performance Meter (SPM) to give a virtualized analyze concerning the system efficiency of a deployed SaaS/application in a cloud [11].

4. Functional Test - The purpose of functional testing is to analyze behavior of an application and fulfill various functional basic requirements. Functional testing just like black boxes testing that need input gets output just after processing that is dependent on test cases. The inner program structure is hardly considered.

Cloud Computing is shared resource as computer software, hardware and network. It gives you computers resource as you need it (when it require) with minimal cost. Cloud computing prospects an opportunity in supplying testing as a service (TaaS) for SaaS and cloud-based applications. This creates new clients possibilities, needs in most recent service versions and also supply software testing way of a particular application solution in a cloud system for clientele while a service based on their demands [23].

#### IV. CONCLUSIONS

Cloud application is effectively the most recent driving prevailing fashion in the IT business. There may be a cheerfulness of a surge in testing arrangements in the cloud. Cloud testing can without much of a stretch be executed by making utilization of diverse bases of cloud abilities furthermore testing apparatuses.

While the besides of cloud items and arrangements and testing as administrations, more noteworthy examination work should be completed to talk about the cases and difficulties in cloud testing. Other as of late, Modify of programming associations towards distributed computing considering a ton of variables particularly cost minimization. Testing inside of the cloud, influences the cloud programs, while expands testing ease of use. For examination researchers, meaning of computerization testing apparatuses for cloud applications as an unequivocal endeavor to be accomplish as a beginner activity.

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