Cloud Testing Vs. Conventional Software Testing Over a Web Service (Pbc -Product's Bio-Data in A Click)

Engineering

Dr.Umamaheswari.E | School of Computing Science and Engineering VIT University, Chennai. Tamilnadu, India.

ABSTRACT *The process of verifying and validating a software application or program to check whether it meets the business and technical requirements, and to verify that it works as expected is called Software Testing. Testing the applications has its own testing tools and testing methodologies. In this paper an overview will be provided regarding conventional software testing vs. cloud testing. An application called PBC (products bio-data in a click) will be developed and both conventional testing and cloud testing will be performed on it to sort the difference between them.*

Introduction

The flawlessness, correctness and excellence of a software product is determined by software testing. Usually will be done inside the organization with the available resources they have in the organization. Testing a new application requires new servers, networks, storage only for a point of time. These are not used once when the testing is completed, thus increasing the budget of the project. Generally setting up a simple test environment may take weeks to months of time for an application, which results in cost and delay of release of the application. Applications were gradually been converting into dynamic, difficult, circulated and component-based, crafting a variety of different challenges for testing groups. Cloud testing opens new gates for testing. Cloud testing is a form of testing in which the resources available in the real world cloud technology are used. To guarantee a trustworthy application, organizations have to test their services on all platforms.
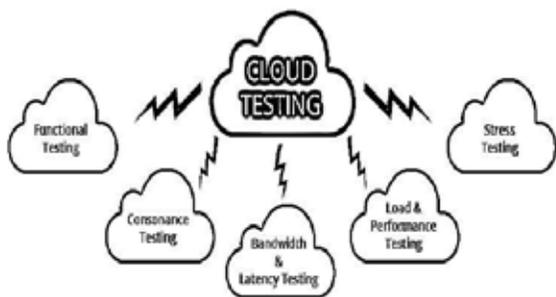

I. ABOUT PBC

In this section a brief description of how the web application is designed is given and its functionalities will be discussed

Product's Bio – Data in a Click is a website that gives you basic and essential information about products under categories namely Beverages, Cosmetics, Pet products etc., Once the product is selected, its necessary information can be viewed. For example, if coca cola is selected under beverages, then its necessary information like its ingredients, nutritional information etc. can be viewed. But just by viewing one product user will not be able to choose the product that suits their needs. Hence a compare option will be provided that helps the user to compare one or more products. The user will be able to provide his/her feedback by entering their basic details. The feedbacks will be sent to the admin. Once the admin authenticates the feedback, it will be displayed in the web page. The user will be able to view which product is viewed more. A login option will be provided for both the admin and company representatives. Company representatives are people referring from individual companies. The admin will have the facility to edit, add or delete products. The company representative will have the
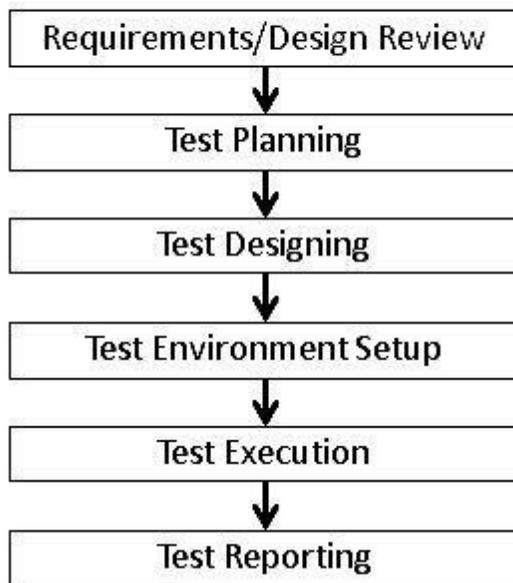
access right to edit, add, or delete those particular company products alone. For example, a PepsiCo company representative will have access rights to modify PepsiCo company products alone. Instead, he/she will not be able to modify other company products. This facility helps the company representatives to add new products of their company when introduced in market.
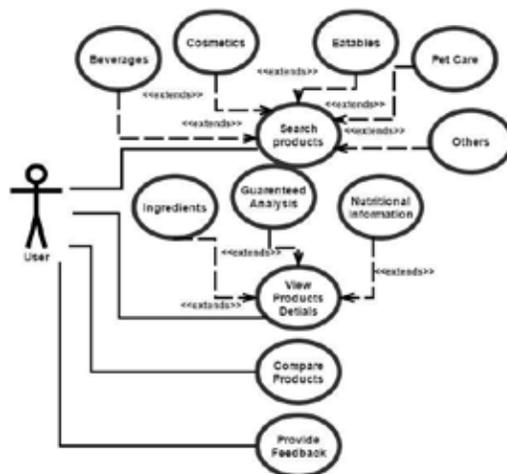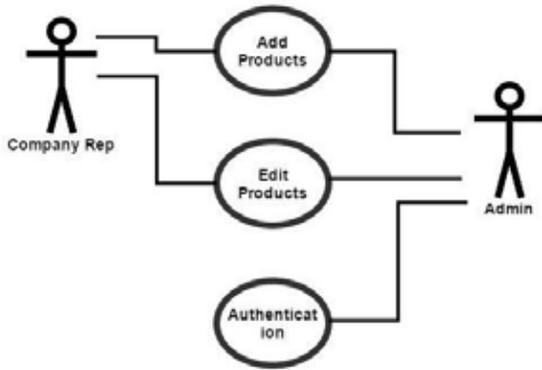
II. CONVENTIONAL SOFTWARE TESTING

Testing is not a single activity, nor it is a development activity, it is a support activity: that is it is meaningless without the development processes and not will not produce anything in its own. Testing is, however, a very important part of the life cycle of any product from the initial idea to development. Testing has its place intertwined with all these activities. Testing must find its place and fill it as well as possible.

A. Testing Levels Based on Software Activity
Each software development activity accompany a different testing type:
a) *Acceptance Testing* – evaluate software concerning requirements.
b) *System Testing* – evaluate software concerning architectural design.
c) *Integration Testing* – evaluate software concerning subsystem design.
d) *Module Testing* – evaluate software concerning detailed design.
e) *Unit Testing* – evaluate software concerning implementation.

At present situation internet plays a crucial role in human life, where web applications are basic part of it. Web applications provide vast features with high values conquering audience across the world. In order to produce a quality and secured service, the web application must be tested thoroughly. In next section, we describe conventional testing techniques.

B. Testing a Web Application

Before we deploy the web service the application will be tested in order to ensure that it meets the

requirements and also to ensure the code is correct without any bugs.

1) Functional Testing:
To make sure that different functions in the system are giving the right output, Functional testing will be performed. Body conditions are tested thoroughly and this will be taken care by test cases. Checks all the links given in the website are working properly.

2) Usability testing
It is mainly concerned in the way the application is used, it checks whether the UI is easily understandable and it's ease to use.

3) User Interface testing
UI testing makes sure that individual modules are connected properly, the input and output from one module to the other are distributed properly. UI testing plays a crucial role in testing web

applications. Application-service-database are the main interfaces in the web application, these should be tested thoroughly and properly.

4) Compatibility Testing
We should make sure that the web application displays properly in various devices, in short it should be compatible in all devices. It's important features include mobile, system browsing, operating system etc.

5) Performance Testing
It measures the performance of the application under various situations which include load testing, stress testing and scalability testing.

6) Security Testing
It is most essential for the web applications since it's important to protect the most confidential data from hackers, by blocking them to intrude into the system. It includes access to most secured pages are locked, data cannot be downloadable without proper access to system.

III. CLOUD TESTING
Cloud testing is a way of testing software in which web applications will be tested in cloud environment. Cloud testing is cost effective when compared to conventional cloud testing because it's

based on the principle Pay – Peruse. It reduces time to market. Not necessary to invest on license cost of tools and infrastructure cost is also reduced. Testing tools include SOASTA, Blaze Meter, LoadStorm, Blitz, etc.,
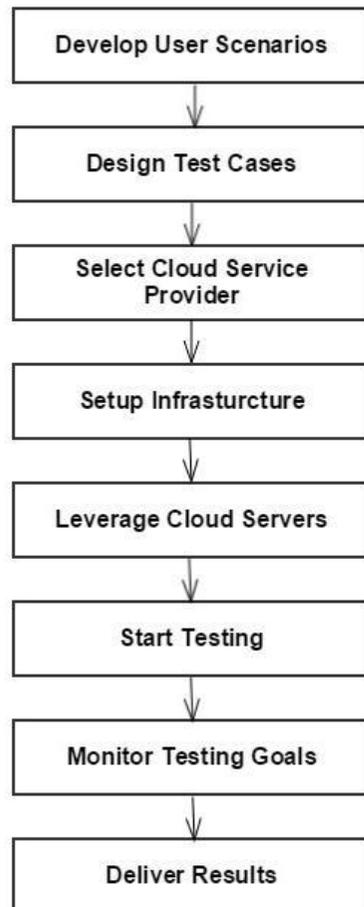
Cloud Testing Life Cycle

A. Testing Web Application in Cloud
Types of testing in cloud

Two types, namely

1) Functional testing
The activities that verify the precise actions or the function of the source code is functional testing.

Functional testing include
a) Multiple Browser Support Testing
Wide range of web browsers are in use now because end users use various types of web browsers to access our web applications. Hence it has become very important to test our application on different browsers now. Different browsers may contain many components like flash, JavaScript, applets

etc... they perform in different manner, and request response of the different browsers also varies. Hence testing on one web browser is not enough. So cross browser testing is done to test the application to check whether it works properly in various browser.

b) Accessibility Testing
Web accessibility testing is a division of usability testing that describes the users with disabilities to know how the system will be used. The final aim of both accessibility and usability testing is to discover, how individuals can use a web site in simple way and to store that statistics back into enlightening upcoming strategies and operations.

c) Availability
Availability refers to the probability of how the system works whenever it is required. In simple word it should be in service all the time.

d) Data Security
Security testing is a process planned to expose defects in the security methods of an data system to safeguard data and keep up functionality as anticipated.

2) Nonfunctional testing
It refers to the activities that may not be related to the precise function or activity of users or specific function such as performance, Security, system behavior etc.

Nonfunctional testing include
a) Performance Testing
Discovering the blockages & boundaries are one of the part of performance testing. To do this a particular workload is necessary. Cloud testing creates such a change in the nature of traffic which is on demand. It reduces lot of cost and time.

b) Load Testing
It is a process of keeping excess demand on the system or the application and quantifying its response. It is performed to identify the behavior of the system both in normal and the highest load situation.

c) Stress Testing
It is used to find the capacity of the service or the application, to maintain certain level to the application. It is necessary for all the services or applications to run under extreme conditions and maintain the stability.

d) Latency Testing
Cloud testing is applied to analyze the latency among the act and the equivalent response for any application after deploying

it on cloud.
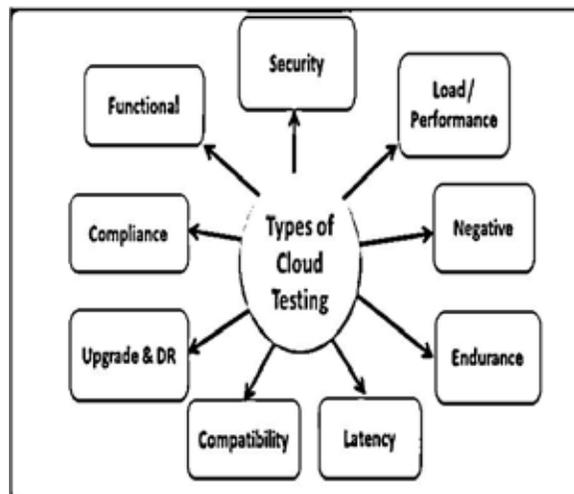
IV. TESTING TOOLS
Various tools are available to test cloud based systems ,in this few tools are chosen to conduct the survey

A. SOASTA
SOASTA is motivated by the necessity to test in production, rather than in a laboratory environment.

Today's web applications usually follow agile practices with frequent builds and high change rates. Load testing with legacy tools in the laboratory can be significantly different from testing in the production environment in terms of scale, configuration, user profiles and network environment. Running tests against production websites thus can achieve higher degree of accuracy and confidence, compared with lab practices.
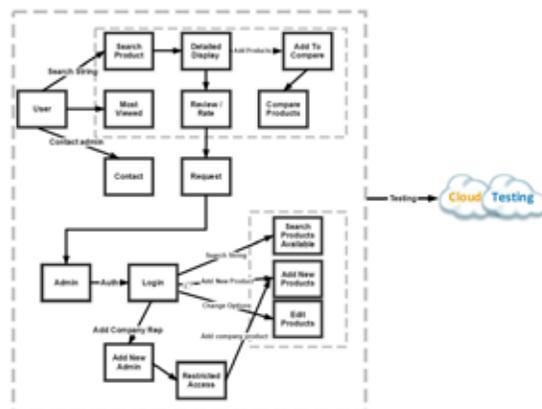
Overall Block Diagram
SOASTA CloudTest is a production performance testing tool for Web applications. It can simulate thousands of virtual users visiting website simultaneously, using either private or public cloud infrastructure service. The worker nodes can be distributed across public and private clouds to cooperate in a large load testing. Test results from distributed test agents are integrated for analysis. Memory-based analytic techniques are implemented to handle, the huge data produced by large-scale testing. Provisioning data are displayed via analytic dashboard on a synchronized time-line. Through an Ajax based web UI, testers can operate and supervise the whole process including launching hundreds of load generation servers, creating and running test agents geographically distributed, and analyzing test results.

B. Blaze Meter

It is a commercial, self-service load testing platform-as-a-service (PaaS), which is fully compatible with open-source Apache JMeter,the performance testing framework by the Apache

Software Foundation. Blaze Meter provides an enterprise grade, 'out-of-the-box' load testing solution for the developer community.

Blaze Meter provides developers with tools for a simple integration into their native development environment by providing mobile, web application, website, web-service or database testing that can simulate thousands of users visiting a website simultaneously using the Amazon Elastic Compute Cloud (EC2) service. Users can run multiple load tests in order to locate and fix performance bottlenecks.

C. Rational Performance Tester

Rational Performance Tester is a tool for automated performance testing of web and server based applications from the Rational Software division of IBM. It allows users to create tests that mimic user transactions between an application client and server. During test execution, these transactions are replicated in parallel to simulate a large transaction load on the server. Server response time measurements are collected to identify the presence and cause of any potential application bottlenecks. It is primarily used by Software Quality Assurance teams to perform automated software performance testing.

V. CONCLUSION

The difference between conventional software testing and cloud testing will be proposed with respect to the web application developed. The website will be first developed based on product details to help user to gain knowledge about products and to find the essential product that suits them. Later the website will be tested based on conventional software testing, then it will be deployed in cloud and perform cloud testing. The difference between the conventional software testing and cloud testing will be analyzed based on the results of the testing on PBC.

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