Study on Testing as a Service on Cloud

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Abstract

Software testing is a process used for evaluating an attributes or capability of program and makes sure that it meets the requirements. Now-a-days testing becomes very important activity in terms of exposure as well in terms of security, performance and usability. If we consider hardware and software licenses, the testing is too expensive task for user. As cloud computing providing anything as a service, it gives idea about testing as a service through which customer can save the cost of maintenance and up gradation. In this paper I have described the Testing As a Service along with its architecture.

Keywords

Testing as a Service(TaaS), Software as a service(SaaS),Cloud computing, cloud testing.

1. Introduction

Software testing is an activity conducted for finding errors in software. It also verifies and validate whether the program is working correctly or not. Software testing is not only finds the bugs but also confirms that either the software is working according to the requirement specifications or not.

Software testing plays a very significant role in the growth of an enterprise. Over time, the software testing function has become a challenging activity for enterprises due to increasing technological complexities, software sourcing challenges.

Typically, software testing is done either internally within the organization. Testing follows its own evolution cycle. This offered customers a dynamically scalable and economic framework which enabled them to outsource their testing requirements.

The final stage of the evolution cycle of testing has manifested in the form of **Testing-as-a-Service (TaaS).** Today, Testing-as-a-Service is being increasingly considered a viable testing model by many organizations to achieve reduced costs and improved service for their IT Test requirements.

2. Testing scoped for change??

All Business companies require high – speed, safe and scalable IT infrastructure, to manage their business requirements. But it is not possible to have this setup in their premise. Now–a–days companies are paying attention towards improving efficiencies and return of investments engaged, CEOs need to review how they can reduce their investments in technology, or get high return on the same or addition investments.Testing is a key to enhance user agreement and reduce the maintenance and cost. On the other hand testing requires organizations to spend in people, tools and its environment and can take up a major profit of the available funds. But the quality can never be compromised. A new approach of development and testing makes the organizations to ensure higher quality but with considerably lower funds. Hence the need for migrating to cloud emerged with a solution for rescuing the organizations to focus on their core business than worrying about the funds and maintenance of their IT infrastructure. But the solution has some issues faced in terms of security, consistency and maintenance which the organizations should focus on accurate testing. Testing as a Service (TaaS), a new cloud based global delivery model can help you address these issues more effectively. In the areas of performance testing, security testing, reliability testing, experience in virtualization technologies and investments in hardware infrastructure, the third party independent testing service providers are well suited to do this work. [10]

3. What is cloud testing?

Cloud Testing is defined as Testing as a service. It industries that deals with testing products and services are making use if cloud based licensing model for their end clients. The offering includes Functional as well as non-functional testing of various applications. The cloud testing provides services in two modes:

Testing as a Service

Functional, Security, Load , Stress, Usability Testing

On-Premise   On-Demand
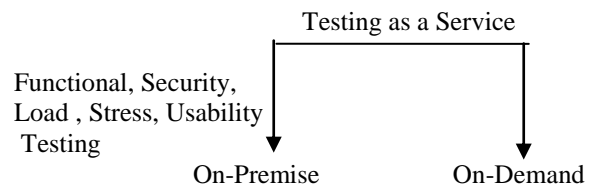
On-Premise: Testing as a service can be used for validation and verification of various products owned by organizations or individuals. Load testing is available in both types.

On-Demand: Testing on demand is used to test On-Demand software. It is becoming increasingly popular to use testing as a service to simulate production such as cloud environments instead of traditional On-Premise testing products [11].

4. Cloud Testing-as-a-Service

There are various features in Cloud testing. One of them is Testing as a service (Taas).It provides the static and dynamic On-Demand testing services in/on/over clouds for the client at any time. The main goal is to reduce the IT budget of business to focus their core business by outsource software testing tasks to a third party using TaaS service model[12].

Testing as a service (TaaS) concept was initially introduced by "Tieto" in Denmark in 2009, and the solution of TaaS was nominated by IBM. Now the TaaS has a wide attention due to its advantage in its scalable testing environment, cost reduction, utility-based service model, and On-demand testing services [12].
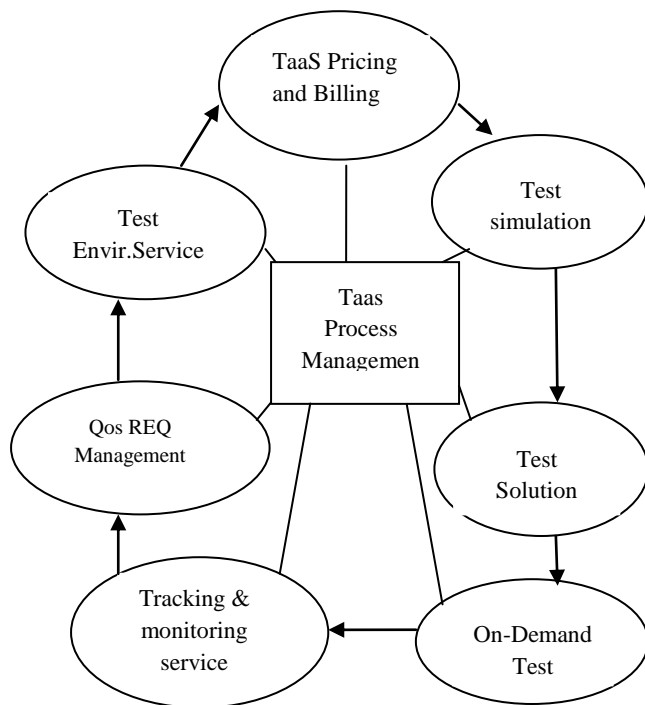
5. Workflow of TaaS

Fig1: Workflow of TaaS

In the above figure we show the workflow of TaaS

- **TaaS process management:** It will offers test process control and project management.
- **QoS requirements management:** It supports QoS requirements, including quality assurance modeling and book keeping.
- **Test environment service:** which provides On-demand test environment services to establish the required virtual or physical based computing resources and infrastructures, as well as the necessary tools?
- **Test solution service:** which offers diverse systematic testing solutions and test-ware generation and management services?
- **Test simulation service:** which It establishes on-demand test simulation environments with selected facilitates and supports the necessary test data generation.
- **On-demand test service:** which provides On-demand test execution services based on selected schedules and test wares.
- **Tracking and monitor service:** which allows test engineers to track and monitor diverse program behaviors at different levels in/on/over clouds for the testing purpose.
- **TaaS pricing and billing:** which enables TaaS vendors to offer customers with selectable testing service contracts based pre-defined pricing models, and billing service.[7]

Testing in cloud or cloud testing have three facets
(1) The system or application under test is accessible online. This might be SaaS software or non-SaaS software.
(2)Testing infrastructure and platforms are hosted across different deployment models of the cloud i.e. public, community,   private or hybrid cloud;
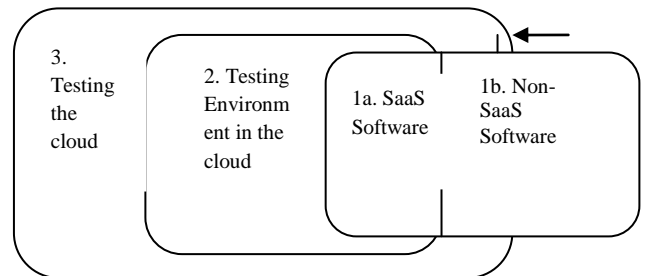

Fig 2: Facets of Taas

(3) Testing of the cloud itself. Cloud environments should be tested and measured for their performance, availability, security and scalability in order to support efficient delivery of services.[10]

6. Why cloud testing is important?

Comparing with current software testing, cloud-based testing has several unique advantages listed below.

- Reduce costs by leveraging with computing resources in clouds – This refers to effectively using virtualized resources and shared cloud infrastructure to eliminate required computer resources and licensed software costs in a test laboratory.
- Take the advantage of on-demand test services (by a third-party) to conduct large-scale and effective real-time online validation for internet based software in clouds.
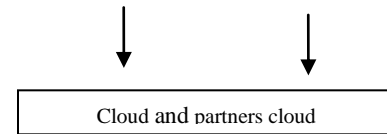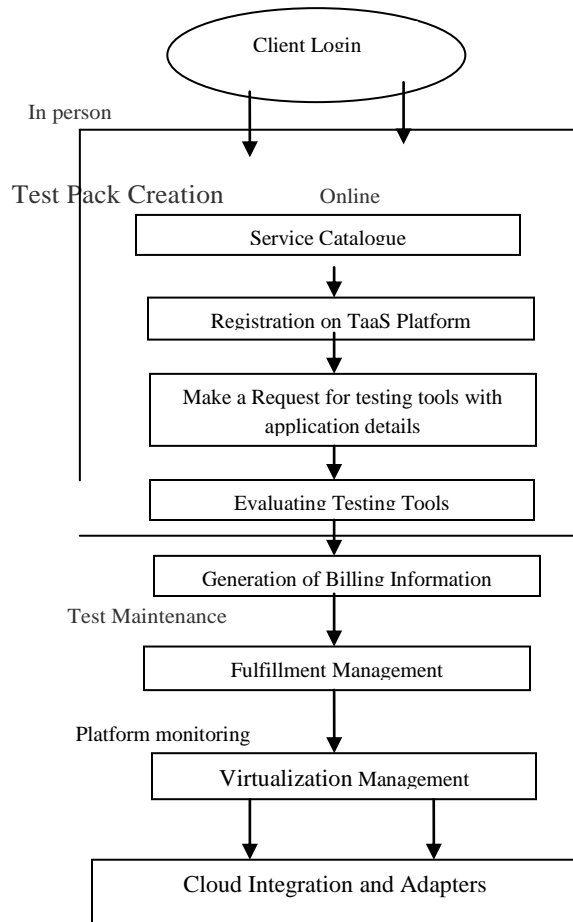
7. TAAS Architecture

Fig 3: Architecture of TaaS

The TaaS Architecture shown above will consist of various layers through which the testing is done. As shown the client should login first. The client may access the platform in two ways either Online or In Person.

The client can use the platform in three ways as follows –

1.) Client have to upload the application on cloud and test the application with the help of their own tester. And have to pay for the tools provided by cloud for testing purpose.
2.) Client can upload the application on cloud and ask to other company to test the application and pay for the usage.
3.) Client may directly go through the testing company for testing the application without uploading the application on cloud

After login the client have a look of service catalogue which will give the information about the services and tools provided by TaaS. Registration of client is necessary on Taas platform to enjoy the benefits and services provided by taas. After registration client have to make a request for the services of TaaS which are required. While requesting the client has to provide its application details on which we perform testing. In this client should select the type of service and Select the type of testing. After submitting the request the request-id is generated. According to request the billing information is generated. The next layer will perform FULFILLMENT management in which client will have to sign SLA which is the agreement between company and client. This is helpful for the billing and auditing purpose. Next layer is PROVISIONING management in which virtualization is done. Which managing the virtual machine is like managing our physical system. Usage and billing is done for the application submitted by client on TaaS platform. The CLOUD ADAPTER is basically used for the integration purpose. It provides the integration of TaaS platform with cloud.[14]

TaaS can be used in the following scenario
1. Functional Testing
2. Load Testing
3. Performance Testing

4.   Mobile application Testing [13]

8.   Benefits of a TaaS on cloud

Testing-as-a-Service has demonstrated significant improvements over traditional testing environments. A major advantage of using the Testing as a service, especially a Public Cloud which is a highly scalable model. Enterprises need space, servers etc. to handle any on-demand computing needs and a public cloud model ensures that the capacity needs can be immediately fulfilled. In terms of costs, the TaaS model is beneficial since enterprises pay for the actual time utilized for testing a leading to controlled costs. The TAAS model also offers licensing benefits since test tools, hardware, application licensing or even operating platforms are managed by the cloud. By switching to TaaS, customers get access to a centralized test environment, with standardized software library and test suites [7][13].

9. Conclusion

In this paper I discussed about the cloud computing along with its very important service which is testing. Testing as a Service is interesting and hot topic in the field of research .Here I described the necessity of TaaS and proposed new TaaS architecture. In future I will include more number of testing techniques in support of TaaS and validate TaaS platform by considering the security issue. As well I will give a proper solution with the various testing required with the different criteria of software development.

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