

A Review on Shifting Software Testing to Cloud

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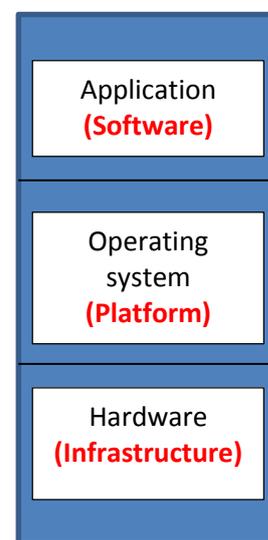
Abstract: Software testing has been one of the tedious task in SDLC. Testing of software sometimes becomes a costly process. Companies have to buy hardware to perform various kind of testing which requires large budget. Cloud computing has reduced much of these cost. This paper discuss majorly about Cloud computing how it is being used for testing software. It is also giving a brief introduction of various risk introduced in cloud testing.

Keywords: Cloud Computing, Cloud Testing Tools, and Cloud Testing.

I INTRODUCTION

The concept of cloud computing is not a new one in fact it is a very old concept. But the term CLOUD is comparatively a new term. Evolution of Cloud computing originated from cluster computing and grid computing. Cluster computing was used when data of company could not be managed by one server, so multiple homogeneous servers were used as cluster. Grid computing was used when a company wanted to share data with systems which were geographically located at different places so this was done by forming a grid on net. Cloud computing can be said to made up of number of groups of servers and these groups are further connected forming a grid all over the geographical area for example Gmail [1]. Generally huge companies require such kind of infrastructure wherein they need to connect their offices which are spread over a huge area. To maintain such huge clouds there are various companies in the market. These groups of servers are actually placed on Internet. Therefore in one way you can say that cloud exist on Internet. Now it would be very costly for a company to keep its own servers on the net. This has given rise to a completely new business there are companies who maintain their server on network and lend them to various companies. From it can be drawn that cloud service model can be of three types. If user take only the infrastructure from the cloud on rent then service is called as Infrastructure as a service (IaaS). If user take

infrastructure plus platform from the cloud on rent then service is called as Platform as a service (PaaS). If user take infrastructure plus platform plus software from the cloud on rent then service is called as Software as a service (SaaS) [2].



CLOUD SERVICE MODELS

There are various types of Cloud computing as summarised below [2].

TYPES	DISCRIPTION	ADVANTAGES/ DISAVANTAGES
PUBLIC CLOUD	Here software, resources and storage are availed by service providers to the public. E.g. Google	The cost is spread over entire public users. Here is access is provided via Internet.
COMMUNITY CLOUD	Hardware Infrastructure is shared amongst organizations	The cost is spread over few organisations.

	that have same objective.	
HYBRID CLOUD	Here numbers of clouds are united together to get the benefits of various deployment models.	Companies can attain various levels of fault tolerance but security becomes a concern here.
PRIVATE CLOUD	Here one company owns a single cloud for itself	This is not an economical model plus management of cloud is the responsibility of a single company

CLOUD COMPUTING TYPES

II WHAT IS CLOUD TESTING?

Cloud testing is the testing of software using cloud. Cloud provides a real-time environment to the testing procedure where traffic can be created on cloud for testing the software [3]. Basic principles of software testing are similar to the one in software testing life cycle. Now cloud testing is usually misunderstood as testing a cloud. 'Cloud testing' and 'testing a cloud' are two separate concepts. Testing of cloud can be explained as verification and validation of cloud services [4].

III METHODS OF CLOUD TESTING

- A) *Functional testing*: It is a testing of features and functionality of software under test. All features and system behaviour are verified with SRS on cloud instead of on-premise [5] [3].
- B) *Load testing and performance testing*: Cloud plays a very important role in this type of testing. Load testing is the testing of software under heavy traffic. It is actually measurement of response time. This heavy traffic is actually created on cloud. [6] Various parameters on which performance testing is done are durability, throughput and system usage [3][14].
- C) *Stress testing and recovery testing*: Stress testing ensures ability of software to keep up with a level of effectiveness under the extreme load that is created via cloud [3]. Recovery testing on other hand ensures recover of data under system crash situation [7].
- D) *Latency testing*: It is the measurement of time interval between the simulation of action and the response from the software after its deployment on cloud [5].

- E) *Compatibility testing and interoperability testing*: now using cloud different platforms (O.S.) can be easily availed on demand and the compatibility of software with different platforms can be easily tested [3] [14].
- F) *Security testing*: This testing is done to ensure the security of software against various attacks [8] [14].

IV VARIOUS RISK INVOLVED IN CLOUD TESTING

Even though cloud testing has reduced efforts and made testing an easier procedure as compared to conventional testing still there are various limitation of testing which is cloud based [10].

- A) *Absence of universal protocols*: Each cloud Providers has their own models and architecture. No pricing mechanism is set for these providers [10] [15].
- B) *Insufficient security measures*: public cloud is more prone to threats as available encryption techniques are not sufficient. In cloud users data may be stored in remote location therefore it is beyond companies reach to look after it. Various solution and procedure are being developed to improve security like privatization on cloud and client partitions [10].
- C) *No proper use of cloud testing environment*: This leads to a price hike. A proper cost model must be prepared by cloud providers [7].
- D) *Limited infrastructure of some cloud providers*: There are some providers who offer limited bandwidth, storage, configuration, networking etc. This makes it tough to build a real time testing environment [7] [10].
- E) *Poor performance of some cloud providers due to number of users*: Some clouds are shared by huge mass, which may lead to long waiting time for their set of requirements to work. In case of maintenance or Cloud under maintenance there is no proper backup plan to tackle such situation [10] [15].
- F) *Difficult to obtain knowledge and skilled staff*: there is less number of skilled people who can perform testing on cloud [5].

V MAJOR NEEDS IN CLOUD TESTING

- A) There should be proper criteria and test models. Proper scalability models should be proposed. So that there is a well-defined structure for performing scalability testing, performance testing etc. [13].
- B) Proper Quality assurance standard and testing structure should be defined so that service Level Agreements can be done by fair means and in a sound manner [13].
- C) New automatic and innovative test solutions must be created. So that variety of clients and software could be tested [13].

VI TOOLS FOR CLOUD TESTING

- A) *Cloudtest by soasta*: This tool has completely changed the testing procedure by migrating the testing from Lab to real world environment. It is used for testing performance and reliability of various websites and application. It creates virtual crowd using cloud methodologies [9]. CloudTest is an application developed by an American company, SOASTA [11]. Cost of these tools depends on the count of load injector that is required per hour.
- B) *Lisa by itko*: LISA is a suite of tools. It includes many tools like LISA service virtualization, LISA Test, LISA Validate, LISA Pathfinder. LISA virtualization service simulates the unavailable resources for testing. In this way a module's testing doesn't have to wait till the development of all its integrated module [9] [7].
- C) *Load Pro By Keynote*: This tool is used for load testing of web application. For providing load it uses traffic of internet. Load pro is basically created for e-business [15].
- D) *Janova By Janova*: The main feature of this tool is that it allows user to write test suite

in English like a story. It is used for performing functional testing [15].

- E) *Testcomplete By Smartbear*: Test Complete is another tool for providing functional testing of application that runs in Microsoft windows. Creating test suites with this tool is comparatively easier just by clicking the test it captures all features. Here test cases can be written from the beginning or already available test cases can also be extended [15].

VII CONCLUSION AND FUTURE SCOPE

The upcoming era of cloud computing will confront large number of security services and challenges. In this paper we have tried to explore all possible risk and needs of cloud testing.

TYPES	REFERENCES
Functional Testing	[5],[6],[8]
Load Testing	[5],[6],[8],[14]
Performance Testing	[5],[6],[8],[14]
Stress Testing	[5],[6],[8]
Recovery Testing	[5]
Latency Testing	[5]
Compatibility Testing	[5],[14]
Interoperability testing	[5],[14]
Security Testing	[5],[8],[14]

Types of cloud testing

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