WHITE PAPER:

Leveraging the Cloud in Software Testing

Introduction:

In the last decade or so, we have seen a tremendous growth in the field of information technology that has evolved and impacted millions of users. This includes an awareness amongst the masses on how to leverage technology in their day to day lives. As usage increases, the user demands from products have also been on the rise. The cloud has herein come into the picture greatly helping simulate end user needs and helping organizations address the demands of its global users.

About the Topic:

Cloud Testing is a simple name for a much larger meaning it holds. It could refer to Infrastructure, Software or Platform as a service (IaaS, SaaS PaaS), but from a testing standpoint and how it has helped empower testers test for global user experience, we are mainly interested from an infrastructure as a service standpoint, where it gives us access to global environments for testing.

For example, if a software is being used by customers of different regions, IaaS helps the tester replicate global user configurations sitting at one place rather than having to depend on different testers in each of those geographies. Bringing in enhanced flexibility and cost effectiveness.

Problem Analysis & challenges:

The following are the common challenges faced in Cloud Testing:-

Service Challenges: Since the organization is now dependent on the cloud based service provider, the biggest challenge is service availability without experiencing undue delays because organizations are looking to adopt cloud services rather than maintaining in-house installations.

The second biggest challenge is the _cloud service assurance_. The service provider should assure timely delivery of cloud services and controls data communication between cloud service and the corporate users

The third challenge is the _service efficiency_. It encompasses efficiency in all aspects from power efficiency to efficient and scalable cloud service delivery using virtualization to cost savings

Security Challenges: Security in cloud is another challenge for organizations. The first and foremost challenge is the security of the confidential data. There can be situations of leakage of private information, sudden disruption of services due to maintenance, virus attack or slow internet speed.

The other challenge in terms of security is _the usage of customer data_. For testing an application effectively, in some cases, production data is required. In some cases, organizations are prohibited from supplying production data to third parties (in this case the cloud based service provider)

The other challenge is the _security requirements_. Cloud based service providers may not adhere to the security requirements that are internally mandated in the organization that uses the cloud service

Lack of Universal Standards and Limited Infrastructure: Presently, there are no universal and standard solutions to integrate public cloud resources with the user company's internal data center resources. Cloud based service providers have their own operating models, price mechanisms and offer very little interoperability. Moreover some service providers offer only limited type of configurations, technology, server, storage, networking and bandwidth which makes it difficult to create real time test environments.

What added advantage does Cloud Testing bring in?

The following are the advantages of leveraging the Cloud for Testing:-

Reduction in Cost: Using computing resources in the cloud (which are shared), organizations are eliminating resource costs in varied ways, especially around infrastructure set up

Testing on Demand: Cloud provides the flexibility of using resources as and when required rather than setting up physical infrastructure. This again greatly saves time and cost passing the benefits to all entities

Flexibility for Scalability: Organizations can scale infrastructure up or down at negligible costs as per requirements in no time, which would otherwise have been both time and cost consuming

Improvement in Quality: Approximately 25% of the defects are attributable to incorrect or inaccurate configuration of environments. Cloud based testing service provider offers a standardized infrastructure that are capable of reducing such errors

Testing of Complex Applications: With the technology at its all-time high, applications are increasingly becoming complex to test. In house test environments are proving to be increasingly expensive and inadequate in handling these complexities. A reliable cloud provider has a range of configurations to pick from in line with the latest needs in the industry alleviating a lot of the overhead in testing such complex applications

CONCLUSION:

Cloud Testing is one of the emerging trends in software testing that companies are now seeing as a very viable option. It is becoming a hot research topic amongst the cloud computing and software engineering communities. With ongoing evolution in these spaces, additional research will for sure continue to bring in solutions to the open issues and challenges making this a more commonly used solution in the software testing discipline.

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