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View Point

Choosing the Right Cloud Based QA Environment for your Business Needs
An evaluation of cloud deployment models and their ideal applicability

- Vijayanathan Naganathan

Abstract

Usually around fifty percent of the enterprise servers in organizations are predominantly used for QA[1]. The current economic downturn and growing business demands are driving QA organizations to look for ways to reduce their total cost of ownership and improve the time to market of applications, by speeding up their deployments in QA environments. Cloud, with benefits like faster time to market and scalable costs, can definitely help organizations achieve their business objectives. This promise has led to the widespread interest in the Cloud.

The previous papers of this series helped organizations understand the challenges associated with traditional QA environments, how the adoption of the cloud can overcome those challenges*[2] and the reasons as to why QA environments is an apt place for beginning an organization's cloud adoption journey*[3]. Even though businesses have begun considering cloud adoption for their QA environments, a common challenge they face is in understanding the different aspects of cloud that would aid their decision in choosing the right cloud deployment model. In this paper we shall understand how to evaluate an organizations' current QA infrastructure and the different cloud deployment models, which would in turn help in determining a cloud deployment model that best suits the organization's business needs and requirements.

Building Tomorrow's Enterprise

Once organizations have taken the decision to take the cloud route for their QA requirements, the next challenge in store is determining the right cloud deployment model which is best suitable for their business needs and size. There are primarily four kinds of wide spread cloud deployment models to explore from an infrastructure perspective, which include private, public, virtual private and hybrid cloud deployment model. However, for this decision to be made an in-depth understanding and evaluation of the existing QA infrastructure needs to be done against the following parameters:

QA Infrastructure Requirements

An organization's demand for QA infrastructure depends on all application requirements, environment needs for different types of testing, the duration of the testing cycles and the frequency of testing in a given calendar year.

Current QA Infrastructure Availability

It is recommended that the organization gauges its existing QA infrastructure assets and makes an inventory of all the related hardware and software assets. Then, it evaluates the need and sees if the current demand for QA infrastructure can be met with what's available or not.

Availability of Budget

It's important to assess whether an organization is keen on moving from a CAPEX to an OPEX mode for their QA environments, the willingness to allocate budget for investments in the cloud and the total budget amount available. These factors play a key role in determining the right cloud deployment model for the organization.

Application Release Calendar

The demand for QA infrastructure also depends on the release calendars for all applications in the organization. This includes taking into consideration factors such as the existence of shared and dedicated QA environments for some applications.

Evaluation & Applicability Scenarios of Various Cloud Deployment Models

After evaluating the current QA infrastructure, now let's look into scenarios that would ideally fit each cloud deployment model. Let's review the pros, cons, applicability scenarios and organizations ideally deemed fit for each of the listed cloud deployment model.

There are primarily four kinds of cloud deployment models to explore from an infrastructure perspective. These include private, public, virtual private and the hybrid cloud.

Figure 1: Evaluation of the various cloud deployment models against some important parameters

Enterprise Private Cloud

The Enterprise private cloud is essentially a cloud resource pool that is within an organization's network and firewall. They are created from already owned and existing hardware and software assets.

Pros
- Optimal utilization of an organization's existing assets.
- On demand provisioning that can be customized to the QA infrastructure needs.
- Higher security and compliance with regulations & standards since the cloud is setup within the organization's firewall.
- The organization can use the time and resources saved from managing the environment, on more important and core business activities.

Cons
- Additional CAPEX would be required to setup a private cloud along with an investment in hardware assets and tools needed for automating cloud provisioning and managing services.

Applicability Scenarios

The enterprise private cloud would be deemed fit for organizations that:
- Already have adequate hardware which suffices their current QA infrastructure needs. In some cases the existing QA infrastructure is underutilized.
- Want to manage future QA infrastructure demands and accommodate all application release cycles with the current availability.
- Are willing to invest in virtualization, cloud management software, SAN storage if needed and server class machine to manage the cloud resource pool in-house or privately.

Ideal for
- Large organizations that have an underutilized QA infrastructure.
- Small and medium sized organizations that lack QA infrastructure assets and need them for a longer duration.

Public cloud

A Public cloud is a cloud deployment model where the cloud resource pool is outside the organization's firewall and is built using a cloud service provider's hardware and software assets.

Pros
- On demand provisioning with no CAPEX involved.
- No vendor lock-in concerns.
- Is low on resource requirement as the cloud service vendor takes care of the same.

Cons
- Concerns include data privacy, security and compliance with regulations & standards.

Applicability Scenarios

The public cloud would be deemed fit for organizations that:
- Do not own any QA infrastructure related hardware assets
- Have no intent to make an investment in building a self-owned QA infrastructure.
- Is short on resources to manage its QA environments by itself or sees the entire process as a digression from their core activities.

Ideal for
- Small & medium sized organizations that do not own any QA infrastructure and have short term testing requirements.

Virtual Private Cloud

Virtual private clouds are third party public clouds or segments of a public cloud that has additional features for security and compliance.

Pros
- On demand provisioning with no CAPEX involved.
- No resource required to manage the public cloud since the cloud service vendor takes care of it.
- No vendor lock-in concerns.
- Compliance with data security, privacy, standards and regulations is possible by using public cloud instances. These public cloud instances are not shared with other organizations who might be cloud service subscribers with the same vendor.

Cons
- Additional compliances like the SAS 70 validation would be needed from the cloud service provider.

Applicability Scenarios

The virtual private cloud would be deemed fit where organizations:
- Do not own any QA infrastructure related hardware assets.
- Do not want to make a CAPEX investment for their QA infrastructure.
- Are short on resources for managing their QA environments.
- Have the prime responsibility of complying with standards, regulations, data privacy and security.

Ideal for
- Organizations of all sizes that do not want to own any QA related infrastructure assets, but have short term testing needs that require security and compliance to standards.

Hybrid Cloud

Hybrid cloud is a combination of two or more cloud deployment models.

Pros

- Improved utilization of an organization's existing assets.
- On demand provisioning can be customized to the QA infrastructure needs of the organization.
- All long term QA environment needs can be managed with the private cloud and short-term/ sporadic QA environment needs that cannot be accommodated with the existing assets, can be managed in a public cloud, without additional CAPEX.
- Data security, privacy, standards and regulations can be complied with, by using private cloud instances and non-critical application testing can be moved into public clouds.

Cons

- Integration between public and private clouds can be a challenge when applications from these types of cloud deployment models need to interact with each other for simulating end to end testing scenarios.

Applicability Scenarios

The hybrid cloud would be deemed fit where organizations:

- Own hardware assets related to QA infrastructure to a considerable extent.
- Are willing to invest in virtualization, cloud management software, if needed in SAN storage and server class machine for managing the cloud resource pool.
- Have standards, regulations, data privacy and security requirements to comply with and
- Cannot completely manage the future QA infrastructure demands with their available hardware assets.

Ideal for

- Large organizations that have the capability to handle majority of their long term QA infrastructure needs within their own private clouds and have certain short-term/sporadic QA infrastructure needs, at regular intervals, which can be handled in a public cloud.

Conclusion

Businesses of all sizes can begin the cloud adoption journey with their QA environments, with a suitable cloud deployment model. It is clearly evident from the evaluation of the different forms of cloud models that while adopting them an organization needs to remember the golden principal of long term resources being moved to private clouds and the short-term and sporadic resources to the public clouds, with a pay-as-you-use mode. This will definitely help the organization achieve an effective ROI.

After organizations explore the different forms of cloud deployment models for adoption and zero-in on a form that suits them, the next step would be devising the right cloud adoption strategy for the QA environment. This would need the organization to partner with a credible cloud eco system integrator that would help the organization in its journey to achieve benefits of lesser time, cost and effort, and accomplish its overall business goals/objectives.

References

1. Cloud computing: Innovative solutions for test environments by IBM Global Services, April 2009

2. Common Concerns with Traditional QA Environments - Is Cloud the Answer?, by Infosys September 2011

3. Begin the Cloud Adoption Journey with QA/DEV Environments by Infosys, October 2011

About the Authors

Vijayanathan Naganathan (Vijayanathan_n@infosys.com) is a Senior Technology Architect with the Independent Validation group at Infosys. With 13 years of industry experience, he currently leads the Cloud and Service Virtualization service offerings for QA. His current work includes helping customers adopt cloud for QA environments, defining strategies and executing them for cloud based application validation.

Vijay blogs at http://www.infosysblogs.com/testing-services/

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