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Journey to Cloud – From Hesitant Beginning to a Feasible Reality

Jyoti Madabhushi

Tata Consultancy Services Ltd.

Synergy Park, Non SEZ,

Gachibowli, Hyderabad 500032

jyoti.madabhushi@gmail.com

Abstract: *Cloud has gone past the hype and is now a reality. The enterprise size, business type, and industry determine the type of cloud. Large and small enterprises must have a robust plan for embarking on a journey to the creation of a cloud. A key aspect is to take care of integration challenges and leverage the existing investments in the design stage itself. Fortunately, cloud offers are more mature now and companies are able to leverage its benefits combined with a high level of security and reliability. Not everything can go to the cloud yet there are many services available with genuine cloud approaches such as commercial flexibility, on-demand models, and fast setup.*

Keywords: *Cloud, Organizations, Applications, Systems.*

INTRODUCTION

Many companies have taken the journey to cloud to make it anyway due to promised benefits from agility and scalability to cost reduction. IT executives who have successfully encountered the dangers have learned many lessons along the way. In the past, it took a considerable amount of time to provision equipment. Now the developers can go to the web, click a few buttons and have a full environment deployed worldwide. The concept of organizations has changed. With the migration to the cloud, there is no locked-in capital expenditure artificial boundary. As organizations move from experimental cloud implementations to using the cloud for mission critical workloads, quality of service requirements is taking new dimensions. Service issues that were overlooked with less critical workloads have magnified, exposing the company to significant risk. To protect against high risk, it is important to translate existing internal data center policies into policies that make sense in the cloud.

Science and engineering could greatly benefit from cloud computing because many applications in these areas are data intensive and computable. It makes economic sense to store the data in the cloud close to where the application runs. Cost per GB is low and processing is more efficient when the data is stored close to the servers. Batch processing systems cover a broad spectrum of data-intensive applications in enterprise computing which have deadlines. Failures to meet the deadlines could have serious economic consequences. Security is a critical aspect of many batch processing applications. Examples of the applications include generating daily, weekly, monthly and annual activity reports for organizations in retail, manufacturing and economic sectors, and inventory management for large corporations, billing, and payroll record processing, aggregating and summarizing daily transactions for financial institutions.

Data storage plays a critical role in the performance of any data-intensive applications. Organizing the storage, choosing storage location, managing storage bandwidth must be carefully analyzed for optimal application performance. Developing efficient cloud applications comes with similar challenges as found in computing, I/O and communication bandwidths of physical systems. These challenges are greatly amplified by the scale of the systems, its distributed nature since most of the applications are data intensive. Though any cloud-computing infrastructure will attempt to automatically distribute and balance processing loads, one needs to place the data close to the processing site and identify optimal storage strategy. Performance isolation is nearly impossible to reach in a real system especially when the system is heavily loaded. This is even more difficult with cloud computing. The performance of virtual machines fluctuates based on the load, infrastructure services, environment and number of users. Security isolation and reliability need to be planned on multi-tenant systems. Node failures are there whenever a large number of nodes compete for computer resources.

Being able to rely on hardware in multiple locations and perhaps from multiple providers decreases the chances of issues preventing service or impacting QoS(Quality of Service). Additional cloud facilities can further improve the odds. The shift to a multi-cloud model changes the question of how to choose between private and public clouds to how to choose the right cloud at the right costs with the right characteristics. Multi-cloud computing can be used by enterprises, website providers, developers, and other businesses to minimize the risks of data loss and downtime and to increase compute power or QoS. Multi-cloud computing can be used to support groups with different needs to provide a high-quality experience to users. This method can also help companies avoid getting locked into the rates of a single vendor and missing out on lower-cost options. Multi-cloud computing is the use of more than one cloud environment to satisfy business requirements. This cloud can be of the same type or a mix says multiple private clouds, multiple public clouds, and multiple managed clouds including managed services or service providers. Journeying to the cloud is a huge trend in IT. After implementing virtualization like data center consolidation, power savings and cost savings over physical hardware, organizations tend to move to the cloud to take virtualization to the next level viz standardization and automation as part of IT processes.

Few organizations are ready to work on organizational changes i.e. the harder people problem that traditional IT has fostered such as silos, duplication of services, security and management of services. These are not usually technical problems. Clouds do not necessarily rely on virtualization instead massive amount of physical hardware are in use behind the scenes. IT departments spent considerable time in wrapping processes and procedures for creating and managing servers. These processes are responsible for monitoring systems, depending on sizing and dependencies, documenting systems designs and responsibilities, handling licensing and more. The journey to cloud is more about personnel challenges and less about technological challenges as processes are torn down and created, routine tasks automated and standardization championed. All levels of management including human resources need to support a transition to the cloud. All facets of the organization will see delays as IT works to improve it itself. It is very important that management prioritizes IT work appropriately and backs up the IT department in the face of complaint about delays in other work due to focus on cloud computing.

DECLARATIONS

List of Abbreviations

QoS - Quality of Service

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Jyoti Madabhushi, B.E, M.S. has got more than 25 years of work experience in IT industry with more than one and a half decade experience in project management. She has worked in various capacities from being a hands-on technical person to project manager, program manager, and portfolio manager to strategic business unit head mapping her portfolio to the changing trends in IT.

End Notes

An important point to be noted for an organization that is moving to cloud is to not underestimate the amount of change that will occur with people, process, and technology. A change management needs to be incorporated early in the process of establishing cloud platforms to properly transition staff, customers, business processes and traditional on-premise technology to the cloud. Moving to the cloud enables the rate of change that was not possible with an on-premise solution and opens up channels for rapidly delivering new business capabilities which can be delivered in months versus years.