ISSN (Online): 2455-7838
SJIF Impact Factor : 6.093

EPRA International Journal of

# Research & Development

# (IJRD)

Monthly Peer Reviewed & Indexed
International Online Journal

Volume: 4, Issue:2, February 2019

Published By
EPRA Publishing

SJIF Impact Factor: 6.093 Volume: 4 | Issue: 2 | February | 2019 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Peer Reviewed Journal

# A SURVEY OF CLOUD COMPUTING

**Ramashankar Yadav**[1]
[1]*G L Bajaj Institute of Technology & Management,Greater Noida, Uttar Pradesh, India*

**Lalan Kumar**[2]
[2]*G L Bajaj Institute of Technology & Management,Greater Noida, Uttar Pradesh, India*

**ABSTRACT**
*Recent interest in Cloud Computing has been driven by new offerings of computing resources that are attractive due to per-use pricing and elastic scalability, providing a significant advantage over the typical acquisition and deployment of equipment that was previously required. The effect has been a shift to outsourcing of not only equipment setup, but also the ongoing IT administration of the resources as well.*
**KEYWORDS:** *Cloud, scientific workloads, business drivers, Cloud computing*

## 1. INTRODUCTION

The Cloud has become a new vehicle for delivering resources such as computing and storage to customers on demand. Rather than being a new technology in itself, the cloud is a new business model wrapped around new technologies such as server virtualization that take advantage of economies of scale and multi-tenancy to reduce the cost of using information technology resources. This paper discusses the business drivers in the Cloud delivery mechanism and business model, what the requirements are in this space, and how standard interfaces, coordinated between different organizations can meet the emerging needs for interoperability and portability of data between clouds.

## 2. PRIMARY BENEFITS OF CLOUD COMPUTING

To deliver a future state architecture that captures the promise of Cloud Computing, architects need to understand the primary benefits of Cloud computing:

- Decoupling and separation of the business service from the infrastructure needed to run it (virtualization)
- Flexibility to choose multiple vendors that provide reliable and scalable business services, development environments, and infrastructure that can be leveraged out of the box and billed on a metered basis—with no long term contracts
- Elastic nature of the infrastructure to rapidly allocate and de-allocate massively scalable resources to business services on a demand basis
- Cost allocation flexibility for customers
- Reduced costs due to operational efficiencies, and more rapid deployment of new business services

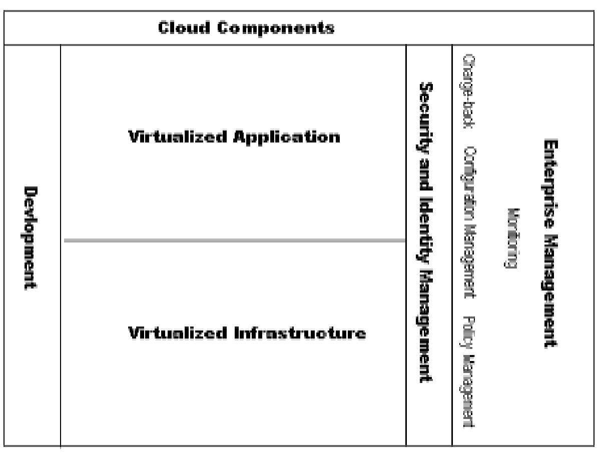
## 3. IT ARCHITECTURE EVOLUTION

Architecture evolves over time. In the 1960s and 1970s, the first wave of computing consisted of large, expensive, labor-intensive, monolithic servers that could be considered the forefathers of the mainframe. Internal resources were pooled and heavy use was made of virtualization to ensure that the very best was made of these very expensive resources.

In the 1980s and 1990s, with the rise of PCs, the shrinking costs of networking and computing infrastructure, and a need for more agility, client/server provided the ability to split the application tier away from the server tier. This was done to support distributed clients running richer user interfaces and also to reduce costs by offloading the user handling, application workloads off monolithic servers. These larger servers remained to address massive batch processing and scientific workloads.

In the 2000's, as data centers started to fill out, and power, space and cooling became more and more expensive, concepts such as commodity grid computing and virtualization started to become established. Cloud computing takes these concepts further by allowing self-service, metered usage and more automated dynamic resource and workload management practices. As services became more and more distributed, SOA emerged as a methodology to integrate and orchestrate distributed business services. This need exists today, as customers require integration between public, private, and in-house services. In some ways, the cloud has become the distributed virtualized mainframe of an era past! It's funny how the same concepts change their clothes but remain constant throughout the evolution of computing. In many cases, today's Cloud was based on foundational concepts that addressed an early need to best leverage computing resources almost 40 years ago. A large monolithic server was easy to secure relative to a virtualized resource on the Cloud. Security is still the number one concern of many customers who want to leverage public Cloud services today.

## 4. ARCHITECTURAL STRATEGIES FOR CLOUD COMPUTING




**Cloud Building Blocks**

The building blocks of cloud computing are rooted in hardware and software architectures that enable innovative infrastructure scaling and virtualization. Many data centers deploy these capabilities today. However, the next infrastructure innovations are around more dynamic provisioning and management in larger clusters both within and external to the conventional corporate data center. There are also implications for next generation application design to make optimum use of massively parallel processing and fault tolerance. The diagram below illustrates some common architectural components:

### 4.1 Virtualized Infrastructure:-

Virtualized Infrastructure provides the abstraction necessary to ensure that an application or business service is not directly tied to the underlying hardware infrastructure such as servers, storage, or networks. This allows business services to move dynamically across virtualized infrastructure resources in a very efficient manner, based upon predefined policies that ensure specific service level objectives are met for these business services.

### 4.2 Virtualized Applications:-

Virtualized applications decouple the application from the underlying hardware, operating system, storage, and network to enable flexibility in deployment. Virtualized Application servers that can take advantage of grid execution coupled with Service Oriented Architectures and enable the greatest degree of scalability to meet the business requirements.

### 4.3 Enterprise Management:-

Enterprise management provides top-down, end-to-end management of the virtualized infrastructure and applications for business solutions. The enterprise management layer handles the full lifecycle of virtualized resources and provides additional common infrastructure elements for service level management, metered usage, policy management, license management, and disaster recovery. Mature cloud service management software allows dynamic provisioning and resource allocation to allow applications to scale on demand and minimize the waste associated with underutilized and static computing resources.

### 4.4 Security and Identity Management:-

Clouds must leverage a unified identity and security infrastructure to enable flexible provisioning, yet enforce security policies throughout the cloud. As clouds provision resources outside the enterprise's legal boundaries, it becomes essential to implement an Information Asset Management system to provide the necessary controls to ensure sensitive information is protected and meets compliance requirements.

### 4.5 Development tools:-

Next generation development tools can leverage cloud's distributed computing capabilities. These tools not only facilitate service orchestration that can leverage dynamic provisioning, but also enable business processes to be developed that can harness the parallel processing capabilities available to clouds. The development tools must support dynamic provisioning and not rely on hard coded dependencies such as servers and network resources.

## 5. PERFORMANCE CONSIDERATIONS

- Cloud infrastructures have the potential to introduce unpredictable performance behaviors. While sharing a large infrastructure can average out the variability of individual workloads, it is difficult to predict the exact performance characteristics of your application at any particular time. Like any shared infrastructure, varying individual workloads can impact available CPU, Network and Disk I/O resources resulting in unpredictable performance behavior of the combined applications.

- Public cloud infrastructures by the nature that they are outside the enterprise data center must leverage wide area network which can introduce bandwidth and latency issues. Multi-peered networks, encryption offloading, and compression are necessary design considerations.
- In addition, many Public Cloud providers have multiple storage offerings with varying performance characteristics. Typically, write performance is typically impacted to a much larger degree than read performance, especially with non-block oriented storage.
- Variability in network resources can significantly impact write operations with clustered application servers. Applications should categorize information that has lower availability requirements to identify candidates for asynchronous writes or replication.
- To overcome many of these challenges, Cloud can leverage proactive scaling of resources to increase capacity in anticipation of loads. For example, if you have implemented a web site that has heavy loads from 9:00 am to 3:00 pm, you can dynamically increase capacity for that period of time. To take advantage of this, your application must be architected to leverage distributed application design.

## 6. SUMMARY

For IT departments in larger enterprises, developing a private cloud often makes the most financial and business sense. When developing the architectural vision, an enterprise architect should bear in mind the characteristics of cloud computing as well as consider some of the organizational and cultural issues that might become obstacles to the adoption of the future state architecture. When moving ahead, decisions must be made on whether the future-state technical architecture should emphasize compatibility with the current standard or start from scratch to minimize cost. Future state systems architecture designs involve trade-offs between lower cost/operational efficiency and greater flexibility. Using an Enterprise Architecture framework can help enterprise architects navigate the trade-offs and design a system that accomplishes the business goal.

## 7. CONCLUSION

Cloud computing offers real alternatives to IT departments for improved flexibility and lower cost. Markets are developing for the delivery of software applications, platforms, and infrastructure as a service to IT departments over the "cloud". These services are readily accessible on a pay-per-use basis and offer great alternatives to businesses that need the flexibility to rent infrastructure on a temporary basis or to reduce capital costs. Architects in larger enterprises find that it may still be more cost effective to provide the desired services in-house in the form of "private clouds" to minimize cost and maximize compatibility with internal standards and regulations. If so, there are several options for future-state systems and technical architectures that architects should consider to find the right trade-off between cost and flexibility. Using an architectural framework will help architects evaluate these trade-offs within the context of the business architecture and design a system that accomplishes the business goal. In any case, Oracle's complete, open, and integrated product set offers a compelling value proposition at each level of the design and our certified Oracle Enterprise Architects can help customers discover a cloud roadmap that works for them.

## REFERENCES


1. *L. Kleinrock. A vision for the Internet. ST Journal of Research, 2(1):4-5, Nov. 2005.*
2. *S. London. INSIDE TRACK: The high-tech rebels. Financial Times, 06 Sept. 2002.*
3. *A. Weiss. Computing in the Clouds. netWorker,11(4):16-25, Dec. 2007.*
4. *Twenty Experts Define Cloud Computing, http://cloudcomputing.syscon. com [18 July 2008].*
5. *R. Buyya, D. Abramson, and S. Venugopal. The Grid Economy. Proceedings of the IEEE, 93(3):*
6. *D. Hamilton. 'Cloud computing' seen as next wave for technology investors. Financial Post, 04 June 2008. http://www.financialpost.com /money /story.html?id=562877 [18 July 2008]*
7. *WIKIPEDIA, "Cloud Computing", http://en.wikipedia.org/wiki/Cloud computing, May2008.[8]IBM,"IBM Introduces Ready-to-Use CloudComputing",http://www03.ibm.com/press/us/en /pressrelease, November 15, 2007*