

# Cloud Computing for Business: Models and Platforms

Gagandeep Kaur<sup>1</sup>, Dr. Sonal Chawla<sup>2</sup>

<sup>1</sup>(Research Scholar, DCSA, Panjab University, Chandigarh)

<sup>2</sup>(Chairperson, DCSA, Panjab University, Chandigarh)

**Abstract:** Modern business can be summed up in three different words: Scalability, availability and accessibility. Since we are living in an age where paradigm-shifting innovations are rolled out more often than at any other point in history and patching the technology is more convenient and effective. This paper discusses impact of cloud computing on business transformation. So different cloud models are discussed with platforms that are used today.

**Keywords:** Amazon, Azure, Business, Google app, scalability

## I INTRODUCTION

Today most of the small and large businesses use cloud computing. In this age of smartphones, place of work can go anywhere. It is almost a virtual desktop operating in unification with a virtual server. The data and applications can go anywhere along with the user. So cloud adds in the flexibility to scale the infrastructure while making this all affordable with pay-as-you-go service. Cloud computing is used either directly by using Google or Amazon or indirectly by using Twitter. Following are the reasons why cloud computing is so widely used among businesses today:

1.1 Elasticity: Elasticity in cloud computing is to allocate and assigned new resources to clients for a short period of time. The startup company could flexibly allocate new resources when the number of visitors augments and later release these resources when they are not needed anymore. In this way it could avoid the decrease in the quality of service and save money on not paying for non-used infrastructure.

1.2 Economical : Using cloud computing, different organizations can share the same physical resources more securely which leads to efficient utilization of shared resources. It also provides convenience of not

having to buy software programs and install them on your own servers/computers which provides cheaper solutions .

1.3 Flexibility: Cloud computing provides access to an application's latest features and functions. It allows users to switch applications easily and rapidly, using the one that suits their needs best. Cloud computing provides applications to be regularly updated, so you don't have to spend time and money doing it.

## II CLOUD COMPUTING SERVICE MODELS

Generally there are three cloud computing service models i.e IaaS, SaaS and PaaS. Each share its own similarities and differences with other.

### 2.1 Infrastructure-as-a-Service (IaaS)

This is the first layer of cloud computing. Using this service model, user manages his applications, data, operating system, middleware and runtime. The service provider manages user's virtualization, servers, networking and storage. According to a 2011 article released by Venture Beat, are Amazon, Microsoft, VMWare, Rackspace and RedHat are some of the famous names in IaaS.

### 2.2 Platform-as-a-Service (PaaS)

This cloud service model could be considered the second layer. In this service model, user manage applications and data and the cloud vendor manages everything else. One popular Platform-as-a-Service is the Google app engine. In this model you pay for what you use. For example a small business who is interested in application testing might find this model beneficial for eliminating costs for upkeeping the hardware. Examples are google app engine.

### 2.3 Software-as-a-Service(SaaS)

This is the final layer of the cloud services model. In SaaS everything in your business is managed by the cloud vendor. As users are using the same softwares so they should have compatibility and easier collaboration. User company need not to pay extra licensing fees and new users can be easily added. Examples of this are online banking and email such as gmail and hotmai[3].

Table 1 provides three classifications of cloud computing [1].

## III EMERGING CLOUD PLATFORMS

Computer industry in these days shift towards providing services by cloud to its consumers regardless of the location and time, so numbers of cloud platforms emerge in these days. Recently several academic and industrial organizations are developing technology and infrastructures for cloud computing. Academic efforts include Virtual Workspaces [4] and OpenNebula [5]. In this section we compare some of the representative cloud platforms. Table 2 provides some representative cloud platforms [2]. Amazon EC2 is also known as Amazon Elastic Compute cloud which provides resizable computing capacity in Amazon Web Services cloud. Using Amazon EC2 it eliminates the need to invest on hardware upfront which saves money and also helps in developing and deploying the application on faster pace. Amazon EC2 provides virtual computing environment known as instances that enables user to run Linux based machines and serve unlimited set of virtual machines [6]. To use the EC2, a subscriber creates an Amazon Machine Image (AMI) containing the operating system, application programs and configuration settings. Then the AMI is uploaded to the Amazon Simple Storage Service (Amazon S3) and registered with Amazon EC2, creating a so-called AMI identifier (AMI ID)[6]. Amazon EC2 charges for the time when the instance is alive while Amazon S3 charges for any data transfer i.e any upload or download. Amazon EC2 automatically add and handles the capacity .For example if traffic increases on your site, it will automatically managed by Amazon. Amazon EC2 also provides security by using firewall that enables you to specify the protocols, ports, and

source IP ranges that can reach your instances using security groups. As of July 2014, Amazon charged about \$0.013/hour (\$9.7/month) for the smallest "Micro Instance" (t2.micro) virtual machine running Linux or Windows [7].

Google App Engine is also known as GAP or app engine[8] which is Paas and helps to focus on application features rather than on managing infrastructure that runs your app..It currently supports programming languages like Python,Java,Go and PHP. Other than supporting the Python standard library, Google App Engine also supports Application Programming Interfaces (APIs) for thedatastore, Google Accounts, URL fetch, image manipulation, and email services. Google App Engine also provides a Web-based Administration Console for the user to easily manage his running Web applications. Currently, Google App Engine is free to use with upto 500MB of storage and about 5 million page views per month [2].

Microsoft Azure platform is used for creating, deploying and managing services through a global network of Microsoft-managed datacenters [9] It deploy highly scalable applications and APIs. Its main focus is on apps not on hardware. It supports both Microsoft specific and other party software and systems with different programming languages, tools and frameworks. It provides both PaaS and IaaS services. In Microsoft Azure, virtual machines let developers migrate applications and infrastructure without changing existing code, and can run both Windows Server and Linux virtual machines.

Salesforce provides Software as a service and is a social enterprise known for its Salesforce customer relationship management (CRM) product, which is composed of Sales Cloud, Service Cloud, Marketing Cloud,. Salesforce.com's platform as a service (PaaS) product is known as Force.com. The Force.com platform allows external developers to create add-on applications that integrate into the main salesforce.com application and are hosted on salesforce.com's infrastructure [10]. Salesforce customer relationship management software is in the cloud, which frees up organization people from cumbersome admin, data entry, and security updates, allowing them to focus on lead generation, closing

deals and gaining expertise by automating business processes, providing deep analysis by approaching into important sales and client data[11].

**IV CLOUD COMPUTING ADOPTION AND CONTROL CHALLENGES**

In India, small and midsize businesses (SMBs) are directing toward cloud services and companies are increasingly turning to technology. To compete with their larger competitors, these companies are moving towards cloud computing particularly high in the areas of data recovery, remote database management, and e-mail hosting [12]. From 2012 through 2017, across all segments of the cloud computing market, cloud services revenue is projected to have a CAGR (compound annual growth rate) of 33.2 percent, with SaaS and IaaS growth rates projected to be 34.4 percent and 39.8 percent respectively [13]. To achieve cost benefits, business agility and more value, companies are now looking at cloud computing as new IT business model. In India Cloud maturity can also be estimated from the fact that even the government sector has recognized the potential of the technology and recently launched the GI Cloud Initiative called ‘Meghraj’ to accelerate delivery of e-services in the country[13]. Top companies like IBM see India as a key growth market.

**V CONCLUSION**

This paper describes the benefits of Cloud computing for modern business and organizations. It also describes differences and similarities between cloud computing models. Main characteristics of three different models i.e. IaaS, Paas and SaaS are

enlisted. These three models are used on different type of platforms. This paper differentiate between four major cloud platforms that are used in these days. In the last section of the paper, cloud adoption and challenges have been discussed. So this paper concludes that cloud computing technology is overtaking the small, medium and large organizations and in future business and organizations can take much more benefits from cloud.

**REFERENCES**

[1] <http://www.ibm.com/developerworks/cloud/library/cl-cloudservices1iaas/>  
 [2] <http://arxiv.org/ftp/arxiv/papers/0808/0808.3558.pdf>. Market-Oriented Cloud Computing: Vision, Hype, and Reality for Delivering IT Services as Computing Utilities by Rajkumar Buyya, Chee Shin Yeo and Srikumar Venugopal  
 [3] <http://blog.appcore.com/blog/bid/168247/3-Types-of-Cloud-Service-Models>  
 [4] K. Keahey, I. Foster, T. Freeman, and X. Zhang. Virtual workspaces: Achieving quality of service and quality of life in the Grid. Scientific Programming, 13(4):265-275, October 2005.  
 [5] I. Llorente, OpenNebula Project. <http://www.opennebula.org/> [23 July 2008]  
 [6] <http://searchaws.techtarget.com/definition/Amazon-Elastic-Compute-Cloud-Amazon-EC2>  
 [7] [http://en.wikipedia.org/wiki/Amazon\\_Elastic\\_Compute\\_Cloud](http://en.wikipedia.org/wiki/Amazon_Elastic_Compute_Cloud)  
 [8] [http://en.wikipedia.org/wiki/Google\\_App\\_Engine](http://en.wikipedia.org/wiki/Google_App_Engine)  
 [9] [http://en.wikipedia.org/wiki/Microsoft\\_Azure](http://en.wikipedia.org/wiki/Microsoft_Azure)  
 [10] <http://en.wikipedia.org/wiki/Salesforce.com>  
 [11] <http://www.salesforce.com/in/>  
 [12] <http://www.zdnet.com/in/cloud-adoption-among-indian-smb-to-soar-7000029009/>  
 [13] <http://www.informationweek.in/informationweek/news-analysis/287810/indian-service-providers-bullish-cloud-adoption>

**Table 1 Classifications of Cloud Computing**

	Paradigm shift	Characteristics	Advantages	Disadvantages and risks	When not to use
IaaS	infrastructure as an asset	Usually platform independent; infrastructure costs are shared and thus reduced; SLAs; pay by usage; self-	Avoid capital expenditure on hardware and human resources; reduced ROI	Business efficiency and productivity largely depends on the vendor's capabilities; potentially greater long-term cost; centralization requires	When capital budget is greater than operating budget

		scaling	risk; low barriers to entry; streamlined and automated scaling	new/different security measures	
<b>Paas</b>	License purchasing	Consumes cloud infrastructure; caters to agile project management methods	Streamlined version deployment	Centralization requires new/different security measures	N/A
<b>Saas</b>	Software as an asset (business and consumer)	SLAs; UI powered by thin-client applications; cloud components; communication via APIs; stateless; loosely coupled; modular; semantic interoperability	Avoid capital expenditure on software and development resources; reduced ROI risk; streamlined and iterative updates	Centralization of data requires new/different security measures	N/A

**Table 2 Some Representative Cloud Platforms**

<b>System/Property</b>	<b>Amazon Compute EC2</b>	<b>Elastic Cloud</b>	<b>Google App Engine</b>	<b>Microsoft Azure</b>	<b>Salesforce</b>
<b>Services</b>	Infrastructure		Platform	Platform	Software and Platform
<b>Service type</b>	Compute ,Storage(Amazon S3)		Web Application	support more complex multi-tier architectures,scaling	Provides CRM
<b>Virtualization</b>	Xen Machines		Application containers	Azure Hypervisor	Resource manager
<b>Web APIs</b>	Yes		Yes	Yes	Yes
<b>Value added service Providers</b>	Yes		No	Yes	Yes
<b>Programming Framework</b>	Customizable Linux-based Amazon Machine Image (AMI)		Python, Java,Go and PHP	ASP.NET, PHP, Node.js, or Python	Oracle Linux, Oracle Exadata, Oracle Database, and the Java platform
<b>User Interface</b>	Amazon EC2 command line tools		Web based administration console	use Microsoft Azure Active Directory to manage OAuth2-enabled applications	Web based framework