A Review on Amazon Web Service (AWS), Microsoft Azure

&

Google Cloud Platform (GCP) Services

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Abstract. This paper is a review of cloud computing services industry and pricing schemes and models followed by them for competitive advantage. Due to this advanced technology many services and resources became available for end users, On the other hand in terms of numbers cloud service provider companies has also shown a rapid growth hence creating competition in the market It traces a brief history of cloud computing, its usage in the industry, major providers and pricing models used by them. This research paper talks about three major players of the market and examines each one of them in detail focusing more on price offerings. This paper also critically analyses the competitive pricing and service strategy followed by various cloud service providers to create an edge in the market. The objective of cloud service providers is to increase profit along with fulfilling objectives of organization and customers' needs. Cloud service providers from types of service like Infrastructure, software, security storage and testing. The paper concludes with the summary of strengths and weakness of each provider of the cloud services platforms.

Keywords: Amazon Web service, Google cloud Platform, Microsoft Azure, Cloud Computing, Virtual Servers

1 Introduction

The demand for cloud services have increased rapidly in recent years result in major boom in cloud platform user's scalability. In today world cloud computing has become one of the major leading technologies. The benefits of cloud have direct impact on services providers and customers. The companies like Microsoft, Google, Amazon, Verzion, Rockspace has regularly change pricing scheme to provide more customer friendly service[1]. Cloud service platforms prove variety of services including storage, upload and Download. Cloud computing has change the way of storing and managing data from traditional approach to new cloud approach. Cloud computing provide data management at efficient price and at reasonable cost. Cloud provides various types of SLA certificate between customer and service provider. As cloud provide various pricing modes and various benefits to its customers. Price is major elements for the organization provides cloud based service because it directly affects customer requirements and company profits. Pricing has direct impact on economy, shares, profits and losses. The pricing

options of cloud computing are very flexible and customized as per the customer requirements and service providers expertise. The service vendor focusses on guaranteed quality of service (QoS) to the customers[2]. Although the pricing of the service is based on set framework of business in the technology industry but this trend is changing now. Due to the newly evolved models of value chain adopted by traditional IT services after the advent of cloud computing, newer pricing models have evolved in this service area[3]. Michael Porter described Value Chain as a "system of independent activities, which are connected by links. Link exist if the way, in which one activity is performed, affects the cost or effectiveness of other activities". Links explain How one acitvity affects another activities and becomes source ,advantage and value addition[4]. Products and services goes through all the activities in a sequential order and at each level the service or product gain value thus these chain of activities give some value to product.

This section will review about various types of cost in cloud computing model. Cost saving is one of the major feature of cloud computing all hardware, software, maintenance, coding cost, power cost, network cost are types of cost involved in cloud environment.

- Hardware cost : All hardware components of data center consist of hardware cost
- Maintenance cost : Security tools cost is known as maintenance cost
- Labor : Troubleshooting task comprises of labor cost
- Computing: Cost / Gigabyte of Virtual RAM
- Storing cost: Cost / Gigabyte of Virtual Disk
- Sharing Costs : IaaS, PaaS, SaaS are types of shared cost in cloud environment

Table 1. Cloud Cost pricing

Cloud Provider Providers	Small	Medium	Large
Amazon	$0.08	$0.12	$0.22
Microsoft	$0.07	$0.12	$0.22
Google	$0.05	$0.10	$0.19
Internap	$0.02	$0.03	$0.05
1&1	$0.02	$0.03	$0.08

2 Cloud Service Providers
Amazon Web Service (AWS) | Microsoft Azure | Google Cloud Platform (GCP)

Amazon web Services (AWS) is one of the oldest players in the market it was started in 2006. It provides a range of computing services like cloud storage, database service, analytics, network Internet of things , mobile computing and enterprise services [6], [7]. As these service provide an organization to grow at faster rate
,reduce their cost and scale up their business. As AWS is one of the oldest cloud platforms in the market and is one of the famous cloud platforms available. So AWS is widely available. Amazon web Services (AWS) has 63 availability zones worldwide.
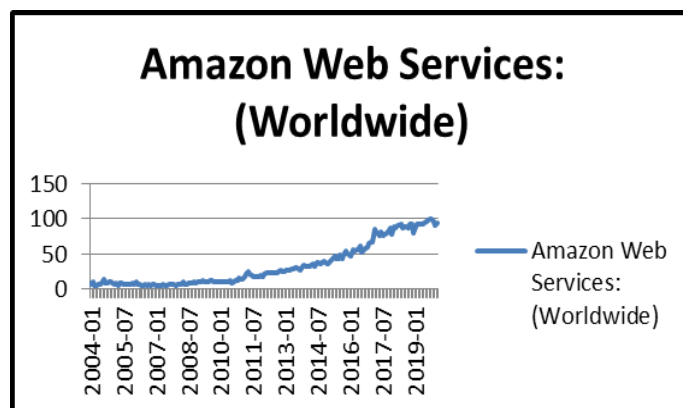

Figure 1. Amazon Web Services Growth Since 2004

Google cloud platform (GCP) launched in in 2011 by Google to provide cloud computing services to its customers. Services provided by GCP includes storage, big data ,databases, analytics, cloud AI, Network, mobile computing, development tools, management tools, Internet of things, cloud security and data transfer. Google cloud platform (GCP) has 21 availability zones worldwide[9][10].
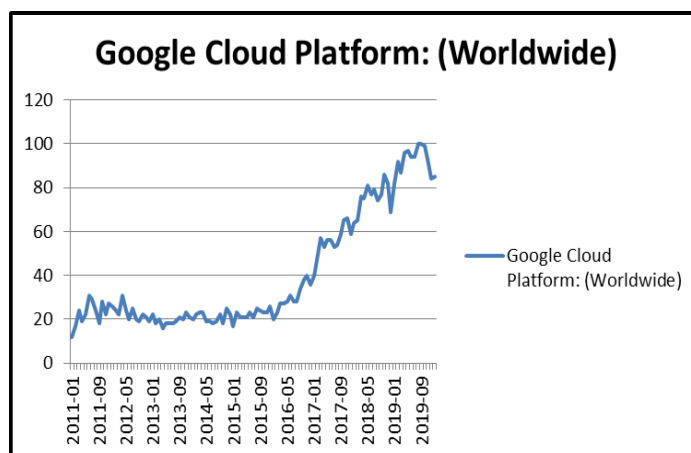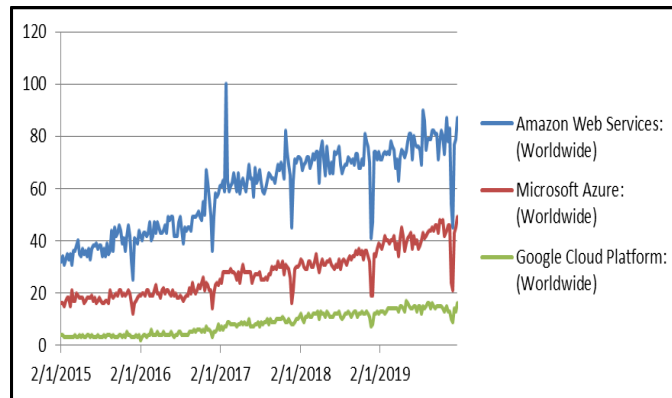

Figure 2. Google cloud platform (GCP) since 2011

3   Cloud Service Providers

Companies like IBM, Google, Amazon, and Microsoft are in race to provide best cloud services to its clients. As US and UK market is dominated by Amazon and Microsoft they are said to be leading tech giants in the world. There is a long list of companies providing cloud service. Now day's small tech organization also started investing in cloud domain. Amazon Web Services (AWS) has the highest market share as compared to Microsoft Azure and Google Cloud Platform (GCP). The graph in figure 6 represents the growth among three cloud service platforms in last 5 years. It is clearly visible that in last 5 years the popularity of Amazon Web Services (AWS) has surpassed Microsoft Azure and Google cloud platform (GCP) worldwide[11], [12]. There are numerous big clients like

Figure 3. Amazon Web Services (AWS) vs Microsoft Azure vs Google cloud platform (GCP)

Netflix, Facebook, BBC, Adobe, Twitter, BMW, Disney, Expedia and many more. Microsoft Azure also has list of clients like Delaware Resource Group, Erickson Advisors, Hudson River Fruit Distributors etc. Google Cloud Platform (GCP) clients are Spotify, HSBC, Snapshot, HTC, Philips, Coca Cola, Domino's, Sony Music, etc[13].
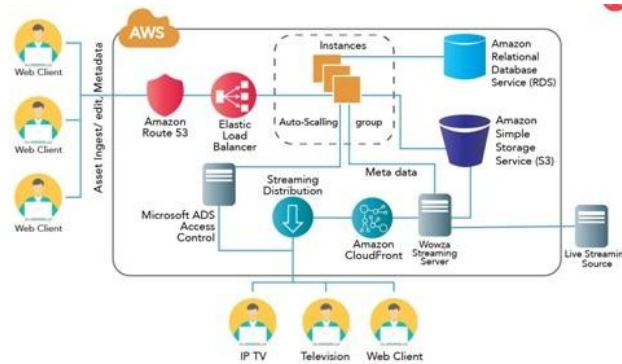
Figure 4. Amazon Web Services Architecture components [20]

Amazon Cloud Front:

It is used for the delivery of content Which is directly used for the website delivery. Its content can be Static, Dynamic as well as streaming content can also take the usage of global network locations as well.

Load Balancing:

Load Balancing helps the server and application to enhance the efficiency. It is used as common network appliance and it help to perform skills in the architecture of the traditional web application. AWS takes the traffic gets distributed to EC2 instances across the varied obtainable sources. Along with this, it also distributes the traffic to dynamic addition and therefore the Amazon EC2 hosts removals from the load-balancing rotation.

Elastic Load Balancing:

It works on the basis of the network load, if the load is low from the network it shrinks the capacity and if the load is high from the network it increases the capacity of the traffic demands and supports sticky sessions to have advanced routing services

Elastic Load Balancer:

It delivers the traffic to web servers and it also helps to improve the performance of the server by elastically distributing the load to the server

Elastic cache:

Here all the memory cache is managed by cloud, so it very efficient web service. It also reduces the services load in efficient manner. It helps in memory management and also helps in reducing the service load in reliable manner.

Security Management:

Security management provides security features known as security groups. It works like inbound network firewall and also specify the ports, protocols and also source IP ranges where all these can be reached to the EC2 instances, with the help of specific subnets or IP addresses, the security groups can be configured that can limit the access to the EC2 instances effectively.

Amazon RDS:

Amazon Relational Database Service deliver the same access that is same/similar to the MySQL, Microsoft

Comparison chart of cloud service providers: Amazon Web Services (AWS) | Microsoft Azure | Google Cloud Platform

Table 2. Amazon Web Services (AWS) vs Google cloud platform (GCP)

Cloud Service Providers	Benefits	Limitations

Amazon Web Services	• Breadth and depth of its services • Developer functionality • Economic benefits for customers • Gold standard for reliability and security • Control market position • Sizeable , develop fully offerings • Help for huge organizations • Worldwide reach	• Cost prohibitive • Usage is not facile • Stewardship of price • Overcoming • Technical support fee
Microsoft Azure	• Adjustable billing • Platform-as- Service (PaaS) is a well-defended suit of Microsoft • Accuracy and expandable. • High level availability • Price-effective differentiate to the competition • After the first biggest provider • Combination with Microsoft devices and software • Integrated public and private cloud • Help for open source	• Consequences with documentation • Imperfect management devices • Comparatively hard to use • Expensive • Data transfer cost • Require platform expertise

Google Cloud Platform	• Deep expertise technology • Current innovation, well- authorize in cloud computing • Adjustable pricing model • Advance costing than Competitors • Live Migration of Virtual Machines • Delegation to • Continued	• Safety and privacy • Bounded control and flexibility • Vendor pin- down • Insufficient characters or services • Historically not as enterprise focused

4. Conclusion

There are n number of service provider in the market and This paper comprises the cost of top three cloud platform service providers along with basic pricing schemes of Amazon web services, Microsoft Azure and Google cloud platform. These platforms allows customers to focus on business rather than technical aspects.The thing is that all three platform have in common are on demand services, flexibility, support and security.

AWS was the first to enter the market and Consumers who look for reliable product to address all their technology needs end up choosing Enterprise cloud services. Microsoft has secured its own reputation as the most trusted name in Enterprise businesses in terms of consumer trust and confidence owing to its high service quality. On the other hand Google cloud has a lot to offer in terms of innovation and Google has their hands in so many small project innovations, which means limited options for larger companies

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