UTM

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TECHNOLOGY AND INFORMATION SYSTEM

Assignment 4 (Azure Fundamentals)

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SECTION-11

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Cloud Computing Fundamentals -
Literature Review on Cloud Computing Service Providers.

1. Introduction:

With the raising amount of data worldwide, maximum organizations are adopting cloud computing technology. Due to the demands of computer applications Cloud Computing came as multi-service provider that shares information, software, and open resources within the virtual environment. Cloud Computing was first presented to the public through a collaboration between two computing comprises, I.B.M and Google.

Today the receiving of cloud computing has early become a key driving force for business because it is convenient, scalable, adaptable and secure in nature. These days the researchers of leading cloud provide Amazon EC2, Microsoft Azure and Google Cloud Platform are striving hard to earn new elevations in this technology. Although these three-cloud computing platforms offer almost similar properties, there are particular disparities which are helping them to keep hold of their spaces. In this article, we are discussing and comparing the leading cloud computing platforms, Amazon EC2, Microsoft Azure, and Google platform and also analyze the pros and cons of these three.

2. Cloud computing

In the literature, there are various definition for Cloud Computing. In general, Cloud Computing is used to describe a new class of network-based computing that takes place over the internet. It is also known as the public cloud, the commercial cloud or just the cloud. Microsoft, Amazon and google are among the greatest cloud provider. Because they grant their computers, storage and networking hardware as a service. User can use the cloud computing Pay-per-Use-On-Demand mode that means only have to pay for the using resources which can conveniently access through the internet. Nowadays, it is the most elevated solution for those who are looking for rapid implementation techniques.

3. Cloud computing service providers

At present there are many companies which provide cloud services. These cloud service providers are named as SaaS, IaaS, PaaS. These services have replaced search hard drive technology. Though there are many cloud service providers in the market here I will discuss three top cloud service providers.

3.1 Amazon EC2: Amazon Elastic Compute Cloud (Amazon EC2) is a simple web service that provides resizable compute capacity in the cloud. It provides all three types of cloud computing but major player in IaaS.

3.2 Microsoft AZURE: It is Microsoft's cloud platform which is used for private as well as public cloud platform. It provides all three types of cloud computing but major player in PaaS.

3.3 Google Cloud Platform: It is also known as Google cloud. It is the first leading cloud computing service which is basically used for google search and YouTube. It provides all the three

types of cloud computing but major player in SaaS and also provides a strong commitment to security and stability.

4. Comparative evaluation

Notwithstanding Amazon EC2, Microsoft Azure, and Google Cloud Platforms offer various high-level features in terms of computing, management, storage, and other services, there are also some differences between these three vendors.

The below table shows the differences between Microsoft Azure, Amazon EC2, and Google Cloud Platform.

Table-1: Comparative between Cloud computing service providers

	Amazon EC2	Microsoft Azure	Google Cloud Platform
Service model (IaaS, PaaS, SaaS)	IaaS (infrastructure as a service)	IaaS (infrastructure as a service)	IaaS (infrastructure as a service)
Virtual Machine	Flexible from micro, small, medium up to large. Offers free low-end VM.	Flexible from micro, small, medium up to large. Offers an “economic” VM.	Flexible from micro, small, medium up to large. Offers a MAC-based VM.
Storage	Currently offers "hot" storage, accessible through Google services at all times and anywhere, prices scale with usage. It also provides cold storage for data that is not frequently accessed and stored for a long time, but it does not take days to retrieve information unlike competitors.	Provides specific storage for azure VM with the option of using physical storage media with prices that scale up to 32 TB in size. In basic use and in annual plan usage, "hot" storage is also available for a discount. "Cold" storage that scales prices with the time range of the contract is also available.	Provides "hot" and "cold" storage, while also providing an "intelligent" level that, when no longer frequently used, transfers hot storage costs to cold storage. There are also many options that complement the range of services provided by EC2.
OS environments offered	CentOS is a full free operating system that is derived from the sources of Red Hat Enterprise Linux (RHEL)	Microsoft Azure supports Operating System listed below: • Windows Server 2008 SP1, • 2008SP2, • 2012,2012 R2, • 2016,2109, • version 1709, • Linux and Ubuntu.	Amazon EC2 is preconfigured with a growing list of OSs. Handlers are also empowered to use their bundling tools to upload your own operating systems.

Security	Google Cloud protection core covers emergency management measures, high environmental visibility, cloud data tracking, IAM software, automatic systems and knowledge encryption all the time.	Microsoft Azure provides a stable base for multi-layered protection and security simplification with built-in controls	Amazon EC2 Protection gives network management access to user instances by configuring VPC accounts and security classes. It also helps people to track their login credentials.
Performance and scalability	In order to ensure consistent, predictable efficiency at the lowest possible expense, AWS Auto Scaling tracks the applications and adjusts power automatically. With AWS Auto Scaling, it is simple to set up multiple resources device scaling in minutes over multiple services.	One of Azure's great features is its ability to scale automatically as the application demands. Basically, increased or decreased application resources are called scaling. Each time a web app is deployed, the instance is created. Creation of the instance means the assignment of a server. In Azure, scaling is easier to configure than traditional hosting. The primary server does not have to be removed. It also eliminates the physical limitations of the addition of resources.	Google Cloud offers products and features that enable you build flexible and powerful applications: The Virtual Machines and Clusters of the Google Kubernetes Engine (GKE) integrating with autoscores enabling you to increase or decrease resource usage based on specified metrics. Cloud Analytics offers measurements in the applications and networks to help you take scaling decisions powered by results.
Pricing model	Google's Cloud Infrastructure has on-demand rates that Google is continuously adjusting in line with the rule of Moore. In tandem with the sponsored use restrictions, which consequently apply while the assets are continuously utilized and sub-hour costs, its clients are empowered to use Google's assets for explosions of remaining activities, all of which allows Google Cloud Platform up to 40 percent moderator than its opposition	Microsoft has been pouring assets into its public cloud engineering Microsoft Azure for quite a long time now, and this is especially evident in the area of Infrastructure as a Service (IaaS). Whereas, before a further incident, Microsoft Azure (starters at $14,300 per year for an 8-worker Web Application Package as seen below) was one of the strongest players in the cloud room, confronted with the behemoths of IaaS, such as Editors' Amazon Web Services ($6,415.00 at Amazon) (AWS) and Google Cloud (Visit Site at Google Cloud)	T2 Amazon EC2 cases. The T2 prospects would substantially reduce costs for applications that can gain from CPU power eruptions. Three sizes (miniature, tiny and medium) of the examples would be available at On-Demand prices beginning at $0.013 an hour ($9.50 a month). You may even access a few t2s. Micro occasions (one operating Linux and one running Windows) via the AWS Free Use Rate free of charge.

Auto-Scaling/Elasticity	Elasticity is a way of supporting the Google Cloud Platform (GCP), which offers the world's superior user organization and size, enhanced security and safety, knowledge investigation, and AI and devices to create current applications.	Elastic computing is the potential to easily raise or decrease device handling, memory and ability to fulfill evolving demands without stressing operational scope and designing the best practicable usage. Typically restricted by frame control equipment, the elastic processing corresponds to the asset calculation allocated to the measurement of the assets currently needed without interfering activities. The Cloud Mobility means that a company does not compensate for idle caps or inert inventory and does not have to emphasize the need to acquire or retain capital for new assets or hardware.	Elasticity helps you to balance the sum of assets you request — which cost cash. Because cloud assets are charged based on their utilization, the synchronization of user needs is important for improving costs. Request covers all outward applications, for instance, the amount of people using a platform for a span of time, and inward use, for example, by the application community using enhancement and test conditions.
Monitoring tools/service provided	Google Cloud Infrastructure is a public cloud management framework with a large range of administrations, such as processing, storage, huge knowledge, AI (ML), application advancement and so on. As any other cloud-controlled applications, Google Cloud requires steady management to sustain its overall efficiency. Application Manager's assistance for Google Compute Engine (GCE), Google's computer device management architecture (IaaS), assists the host level in lighting asset usage through eventual incident, firewall and quantity steps.	Azure Monitor allows to expand the software and administrations' functionality and execution. It gives a detailed solution to the selection, analysis and tracking of telemetry from the cloud and local conditions. These data allow you to see how the apps work and consider the challenges that affect them and the assets that they draw on proactively.	The subsequent stage is to create a norm for ordinary Amazon EC2 execution in your current situation after establishing monitoring targets and making your observing arrangement. Amazon EC2 can be calculated at various periods and under different burden conditions. For e.g., you can screen use of CPUs, I/O plate and organization for EC2 occurrences. At a period when execution is beyond the configuration gage, you can need to reset or forward the event to decrease the CPU utilization, increase plate I/O, or minimize network traffic.

When choosing any cloud platforms, it is important to keep their strengths and weaknesses in mind and also which tool is best suited for our purpose. Because each vendor has their own characteristics in cloud computing which vary from each other. Below is a table of advantage and disadvantage of these three service providers.

Table-2: Overview and comparative Advantages between Cloud computing service providers

Amazon EC2	Microsoft Azure	Google Cloud Platform
• Recommended for all use case which run well in a virtualized environment • Corroboration for huge organizations • Greatest reach for global • Prevalent market position • Most Advanced, enterprise-ready provider	• Recommended for all use case which run well in a virtualized environment • Second largest provider • Corroboration for open source • Ideal for hybrid cloud • Seamless integration with other Microsoft products and services	• Recommended for big data and analytical applications. • Great reputation in the open-source community and portability • Deep discount and supple contracts • Full container-based model • Model for cloud-native business.

Table-3: Overview and comparative disadvantages between Cloud computing service providers

Amazon EC2	Microsoft Azure	Google Cloud Platform
• Difficult to usage • Lack strong hybrid cloud support • Overwhelming options	• Complication with documentation • Partial management tooling • Poor corroboration for large-scale performance	• Hard and fast in contract negotiations • Small number of feature and services • Late enterer to IaaS market

5. Opinion

After discussing the above service providers, we can understand that each of the leading vendors has their particular potency and disability which make then good choice for certain projects.

If talking about Amazon EC2, then it has more good characteristics as compared to Microsoft Azure and Google platform. When we are looking for more global reach, flexibility, wider range of services, stable and reliable services then Amazon EC2 is a good fit. It is more prevalent in IaaS service than Azure and Google. While talking about Microsoft Azure, it also has good features and it is bit cheap as compared to Amazon. It is dominant in SaaS and IaaS as compared to Amazon. It is familiar name for people than Amazon and Google platform. When we are looking for hybrid solution then it is a good fit for users. Google cloud platform is a good rival of Amazon and Azure Because of good security and low price. It is dominant in PaaS as compared to Azure and Amazon.

When we are looking for a comprehensive container-base mode, green tech solution, hyperscale networking environment then it is a good fit for users.

Although Microsoft Azure, Amazon EC2 and Google Platform have their Owen goodness and are preferred by developer, I consider Microsoft Azure is good for me. Because it is the most comfortable platform to use to host a website and also cheapest as I can host 10 websites free. Amazon is somewhat hard to use for beginners and Google Platform is straightforward to use. Azure does let you set up virtual machine password but Google and Amazon cannot set password up for virtual machines when you are in portal. Azure is good for a software developer in Windows-based Organization because most of our business apps and platforms are Windows-based. In these above reasons I choose to use Microsoft Azure.

6. Conclusion:

The world of today Cloud computing services has triggered a revolution in IT companies. It has become a potential dynamic go-to factor proposing abundant benefits for companies whether big or small. Microsoft Azure, Amazon EC2 and Google Cloud Platform are the most popular cloud computing platforms for business and company.

This study sought to conduct a systematic review of the extant literature on cloud computing service providers. This paper has analyzed cloud computing fundamentals in terms of the features, comparative evaluation and opinion with different point of view of these three most prominent cloud computing service providers. This paper has also discussed the reasons to choose Cloud Service Provider. It is quite difficult for any of the cloud service provider to be fond of one particular platform because these three Vendors have their own components which are preferred by developer. Under such circumstances, it is essential to realize the strength and weakness of the three service providers which will help to give an idea for selecting a platform.

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