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Cloud Computing Service Providers

Introduction

Cloud computing is the distribution over the internet ("the cloud") of information services, including servers, storage, databases, networking, applications, analytics and intelligence, to provide quicker innovation, scalable resources and economies of scale. Over the last decade, the world of cloud computing has changed considerably. The room is not only crowded with more providers and service offerings, but also cloud infrastructure that has historically been limited to single data centres from suppliers is now expanding (Verghese & Buyya, 2018). Cloud computing is growing at a very high pace, and the demand for cloud services is expected to hit new heights in the years ahead. Organizations and individuals may obtain on-demand network access to a common pool of managed and scalable IT resources, such as servers, storage, and applications, with cloud computing. According to Ali Sunyaev, Cloud computing also offers the infrastructure that has driven key digital developments such as mobile computing, the internet of things, big data, and artificial intelligence, accelerating the dynamics of the market, challenging traditional business models, and fueling digital transformation. Three of the cloud service providers currently on the market leading the rankings are Amazon Web Services, Google Cloud and Microsoft Azure. But it is still advisable to know what the company criteria are in regards to IaaS, PaaS and SaaS before selecting a cloud service. Cloud computing, however, not only presents a large range of advantages and opportunities; it also comes with many obstacles and concerns, such as securing the data of consumers.

Comparative evaluation:

These are the three main categories when it comes to cloud computing. The 3 service models are named as IaaS, PaaS and SaaS.

SaaS: It allows the software to be more accessible over the Internet from third parties. Examples of SaaS are: Google Apps, Dropbox, Salesforce, Cisco, Concur, GoToMeeting, Slack.

PaaS: It provides tools and platforms that are available on the Internet. Examples of PaaS are: AWS Elastic Beanstalk, Windows Azure, Force.com, Google App Engine, Apache Stratos.

IaaS: It offers cloud services such as: storage, payments, networking, virtualization. Examples of IaaS are: Rackspace, Amazon Web Services (AWS), Microsoft Azure, Google Compute Engine, Magento

IaaS VS PaaS VS SaaS

No.	IaaS	PaaS	SaaS
1.	One doesn't need to install anything, as it is readily available on the browser. The only thing needed to be done is to sign in. There are also mobile apps available.	It gives the administrators a lot of control over the platform software and the applications that are built with the platform.	The customer manages almost everything including the operating system, virtual machines (VMs), or containers, and the other applications that might be used or the middlewares.
2.	One can use the software from any device, and only need to log into the account from the device.	These cloud services often allow and support multiple programming languages, which gives developers the chance to work on several different projects.	Lower or no expenses on hardware infrastructure, including structure such as servers, storage, networking resources, and similar. No need to invest in expensive infrastructure as a business.
3.	All the staff or associates will be able to use the software without the need to download. All staff will be able to sign in and use the software.	It allows developers to build custom applications online without the need to deal with data serving and storage.	Good scalability. This is particularly true of cloud-based solutions, which allows access to the additional resources for scaling apps.

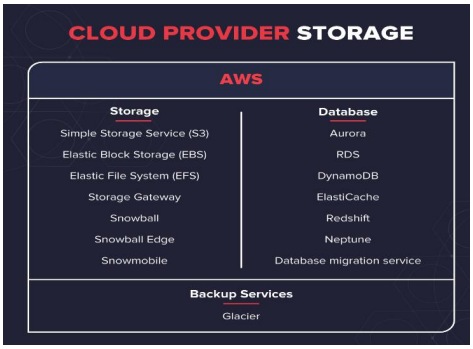
Virtual machine (VM) instance types offered can vary in some kinds.

When it comes to VM access, there are some key differences between Google Cloud vs Azure. These differences depend on the type of machine one is using. For Linux machines, there are differences in SSH-based machine access. The platform also supports SSH from the browser, allowing direct access to your VMs through a web browser, which avoids storing keys on the local machine. With Azure, there's no SSH browser access, and you must include your own key if you want SSH-based access.As for Windows machines, access is similar across the platforms. Both Compute Engine and Azure support access to your VMs through standard channels including Remote Desktop Protocol (RDP) and Windows Remote Management Service.

Both Google and Microsoft offer 100s of machine types, that can be deployed in many different configurations. You can scale your VM resources to meet demand, increasing the number of CPUs and GB of RAM to extreme high-end specifications. These currently top out with:

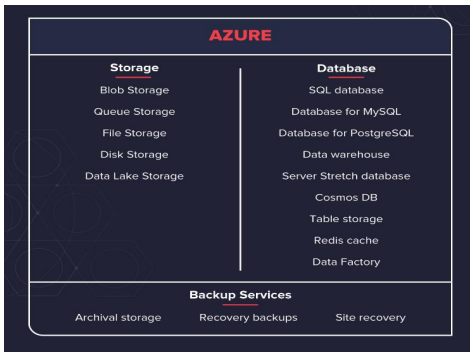
- Google Compute Engine VMs scaling up to 416 vCPUs and 11,776 GB of RAM.
- Microsoft Azure VMs scaling up to 416 vCPUs and 11,400 GB of RAM.

Both platforms share the same categorization of machine types to help in your resource selection. Depending on your requirements, you can choose machine types from shared core, general purpose, memory-optimized, compute-optimized, storage optimized, GPU, and high-performance categories. Each instance type includes one or more instance sizes, allowing one to scale one's resources to the requirements of their target workload. AWS includes the VM instance types as: Mac, T4g, T3, T3a, T2, M6g, M5, M5a, M5n, M5zn, M4, A1.

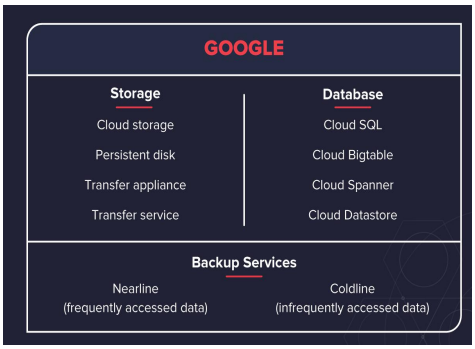


For AWS, GCE and Azure the storage comparison and the OS environment offered are as follows:
Amazon Elastic Compute Cloud (Amazon EC2) instances, on-premises servers, and virtual machines (VMs) must be running one of the following operating systems in order to be used with AWS Systems Manager.

Operating system types such as: Linux, macOS, Raspbian, Windows Server



Windows Azure isn't actually a single operating system (OS), but is composed of several different OSs all working together. Windows Azure is a virtualized environment running on a customized Hyper-V platform. Instead of spending a great deal of money on specialized equipment, the data centre design is based on using commodity hardware together with a self-healing platform so as to create a resilient system.



Windows Google Cloud Platform is a part of Google Cloud, which includes the Google Cloud Platform public cloud infrastructure, as well as Google Workspace (formerly G Suite), enterprise versions of Android and Chrome OS, and application programming interfaces (APIs) for machine learning and enterprise mapping services.

Security:

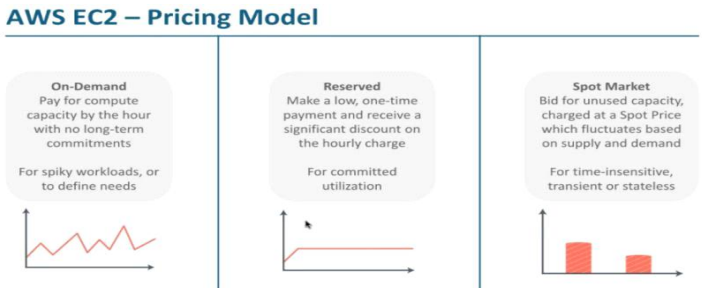
According to the opinion of the experts, the security of AWS is one of the most secure cloud computing sites available right now. The key security features include API activity monitoring, Basic threat intel, WAF, data loss prevention, security groups (**firewalls**), Granular Identity and access management (**IAM**). One of most important AWS feature is the access of accounts. It's only possible when you open access. Since access is limited, it's quite hard to breach accounts and receive information. The truth is in AWS you'll experience less security issues. In case of Microsoft Azure, it gives access to accounts by default which is a big security concern. Its security system is less complex than the one of AWS. Since Microsoft azure allows by default, ports and other stuff related to documents remain exposed, also it's not possible to change this system. The thing is, if you're using Microsoft azure you can be secure but you need to be careful with the way you're using. Google cloud platform is quite new but it has shown some pretty impressive work on the security system. They have a cloud security command centre which is their version of security hub. Since its new, there are fewer number of security experts with deep google cloud platform experience. There are also fewer tools as compared to the other two systems.

Performance and scalability:

The AWS performance is quite high and its degree of scalability is also high. The performance of Microsoft azure and GCP is quite the same as AWS which is high. Their degree of scalability is also considered as same as AWS.

Pricing Model:

In case of AWS, the pricing model looks like this:



For GCP the pricing model depicts per minute rounded up as well as on demand sustained use. For Microsoft Azure, it depicts the per hour rounded up and the on demand reserved spot.

Auto Scaling/ Elasticity:
AWS provides auto scaling services. Azure's virtual machine scale sets is mainly considered as it's auto scaling service. GCP provides auto scaling services as well.

Monitoring / services:
You'll almost find 18,000 services in AWS so far. They include **developer, engagement and monitoring tools, Machine learning and predictive analytics, Databases and storage solutions, Business productivity tools, App integration, Compute.**

Services of Azure includes big data and predictive analytics, game and app development, scalable data wire-housing, blockchain technology, devops, IoT integration.

Services of GCP includes data management and storage, app development, SMB business analytics and AI, productivity and workload management tools.

Opinion:

If I were to use one of the service providers, since it provides its consumers IaaS and PaaS services, I will try with Amazon AWS (Amazon web services). We can get cheap and fast creation through the use of IaaS and PaaS. Since SaaS is essentially used for end-customers who portray that there is no link at all with growth.In the other hand, system managers and engineers use IaaS and PaaS, respectively. And our preferred service provider, Amazon AWS, also delivers IaaS and PaaS.

Conclusion:

First of all, it is straightforward to use and the Interface is user-friendly so that anyone can have a pleasant experience with the user. Second, anytime anyone tries to build an Amazon AWS account, it is scalable and cost-effective to use to start creating certain features and software already prepared for the creator to use them in their web creation. Amazon AWS is a modular platform which uses AWS tools, auto scaling, and elastic load balancing to demonstrate high performance.

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