Cloud Computing Service Providers: Amazon EC2, Google Cloud Platform, and Microsoft Azure

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1 Introduction

Cloud computing platform is one of the hot topics that happen right now. It can help us to less the operating costs, dash our framework accurately, and scale our business needs development. Amazon EC2, Google Cloud Platform, Microsoft Azure, Dropbox, and many other cloud services. We will provide the comparative evaluation for the Amazon EC1, GoogleCloud Platform, and Microsoft Azure with more detail. The cloud offers faster deviation, economies scale, and more flexible abilities.

2 Service Model

AWS (Amazon Web Services) is a comprehensive, evolving cloud computing platform provided by Amazon that includes a mixture of infrastructure as a service (IaaS), platform as a service (PaaS), and packaged software as a service (SaaS) offerings. Google Cloud Platform provides infrastructure as a service, platform as a service, and serverless computing environments. Azure on the other hand provided infrastructure as a service (IaaS), platform as a service (PaaS), and packaged software as a service (SaaS), and Sharing Responsibility.

3 Virtual Machine

A declarative approach for beginning containers is provided by Compute Engine instances. You may have a Docker image name and boot setup while building a VM or an instance prototype. The Compute Engine will look at the rest. VMs of the A-series has CPU performance and memory settings better matched to workloads at the entry stage. They are economical and offer an alternative for getting started with Azure at a low rate. The Av2 Standard has comparable CPU performance, but more RAM and faster disks per vCPU.

4 Storage

There are also cases where storage can be retrieved from disks physically connected to the host device. For instance, the Instance Store offers temporary block-level storage. Transfer Appliance is a shippable storage server for offline data transfer that resides in your datacenter and then ships to an intake location where the data is transferred to Cloud Storage. High-performance, extremely robust block storage for your mission- and business-critical applications is provided by Azure Disk Storage. To maximize cost and efficiency for your workload needs, select from four disk storage options: Ultra Disk Storage Premium SSD, Regular SSD, and Standard HDD.

5 OS Environment Offered

For .NET, they have the AWS SDK that helps one to programmatically call AWS infrastructure facilities. They also have a collection of AMIs that are pre-bundled with ASP.NET and IIS that are freely available. The default OS Image node in the Kubernetes Engine is the Container-Optimized OS. It is Google Cloud Platform's chosen OS for Kuberne deployments. Using the CoreOS toolbox utility, we can run instruments like ping, the gcloud command-line tool, pstree, htop, and emacs. Windows Azure is a virtualized environment running on a customized Hyper-V platform. The physical servers that are used within the Windows Azure Data Centers vary little in their configuration. Cloud Services and Windows Azure Virtual Machines run on a partition on one of these physical servers.

6 Security

AWS is responsible for the security of the technology in the AWS Cloud that operates AWS services. As part of the AWS Compliance Programs, third party auditors regularly test and verify the effectiveness of their security. For Google Workspace and Google Cloud Platform products, Google makes these Google Cloud Enterprise Privacy Commitments. These obligations are supported by the strict statutory privacy obligations that they make available to our customers (here for Google workspace, and here for Google Cloud platform). They will improve our security posture with the Azure Security Center. This means monitoring the security plans and implementing them.

7 Performance and Scalability

The term Application Performance Monitoring (APM) applies to the management of software product performance to ensure the expected quality of operation. Until actual customers are affected, APM tools seek to diagnose and classify device efficiency challenges. To help users create flexible, productive applications, Google Cloud offers products and features. Digital machines from Compute Engine and Google

Kubernetes Engine (GKE) clusters are combined with auto-scale. Consistent consistency throughout large data sizes can be accomplished by database products such as Big Query and Cloud Spanner. Owing to the specifications of the program usage, Azure service is able to auto-scale. Each time a web app is implemented, instances are generated. Growing the example indicates that the servers allocated to that application are added up. There is no reason to shut down the main server. It also removes the physical limitations of services being introduced.

8 Pricing Model

There are five ways to pay for Amazon EC2. Users can pay for Dedicated Hosts, which provide capacity for their use on physical servers. Based on monthly usage, Google Cloud offers rebates and automatic savings. Save up to 57% on Compute Engine resources with committed usage discounts. Compared to pay-as-you-go rates, Azure Spot Virtual Machines (Spot VMs) offer users discounts of up to 90 %. For workloads that may be disrupted, Spot VMs are perfect, offering scalability while reducing costs.

9 Auto-Scaling/Elasticity

Amazon Web Service (AWS) Auto Scaling tracks and changes power dynamically for your programs. Application scaling is simple to install in minutes with multiple resources across multiple providers. The service offers a simple, efficient user interface that helps you to create resource scaling plans. Compute Engine (Google Cloud Platform) offers a service that can add or remove Virtual Machine (VM) instances from a group of managed instances. Autoscaling helps developers manage changes in traffic adeptly. When the energy demand is low, it lowers prices. Cloud Services, Mobile Services, Virtual Computers, and Websites are built-in features of autoscale in Microsoft Azure. When demand increases, it makes apps do their best. You might have a web app, for instance, which manages millions of requests during the day and none at night.

10 Monitoring Tools/Service Provided

Amazon EC2 is a cloud-based software service that offers stable, resizable computing power. It is designed for developers to make web-scale cloud computing simpler. The physical Compute Engine clusters reserved solely for users are Google Cloud sole-tenant nodes. For bring-your-own-license (BYOL) programs, they ease implementation. Track compatibility with patches across Azure, on-premises, and other Windows and Linux cloud services. Schedule installations within a given maintenance window to organize the upgrade installation.

11 Conclusion

In conclusion, the term is generally used to describe data centers available to many users over the Internet. For example, as mention above it reduced IT costs, cause moving to cloud computing may reduce the cost of managing and maintaining your IT systems, etc. Likewise, there are many other benefits of cloud computing such as scalability, accessing automatic updates which are important to these technologies nowadays.

12 Opinion

Azim. The advantage that I found in Google Cloud is that it is more convenient to use. For Amazon EC2, I found that they have multiple locations based on Regions and Locality Zones. I found there are no advantages from these three-cloud computing service providers. If I can choose one of the cloud service providers, I will choose Google Cloud Platform.

Ameera. I choose Google Cloud Platform because its user interface is easy to learn and use. Besides, I have used Google Cloud for a long time and the services are efficient for me to use.

Amir. I would choose Azure Cloud Computing because I know Azure Cloud Computing better than the other two Cloud Computing Services. It also offers great services with a wide variety of guarantees for their qualities and safety.

Khalid. Cloud computing is the availability of computer system resources, especially data storage, which has many advantages. Flexibility of work practices, business continuity, and collaboration efficiency are all advantages. So, I will choose Google Cloud Platform.

References

1. https://aws.amazon.com/autoscaling/
2. https://www.dynatrace.com/platform/application-performance-monitoring/
3. https://cloud.google.com/compute
4. https://cloud.google.com/pricing
5. https://azure.microsoft.com/en-us/pricing/spot/
6. https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/ec2-security.html
7. https://docs.microsoft.com/en-us/azure/security-center/security-center-introduction
8. https://cloud.google.com/security/privacy
9. https://cloud.google.com/container-optimized-os/docs/concepts/features-and-benefits#use_cases_for_container-optimized_os
10. https://cloud.google.com/compute/docs/instances
11. https://azure.microsoft.com/en-us/pricing/details/virtual-machines/series/