

Three Cloud Models

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Introduction

The versatility of cloud computing relies on the distribution of services on request. This allows the use of cumulative device capital, negating the need to delegate individual hardware to a mission. Until cloud storage, websites and server-based software were run on a specific device. With the emergence of cloud computing, tools are being used as an aggregated virtual machine. This amalgamated setup offers an environment in which programs run independently without any particular configuration reference.

The cloud computing architecture consists of the front end and the back end. These two components are linked to the network, in most cases to the Internet. The front end is the vehicle in which the customer communicates with the system; the back end is the cloud itself. The front end consists of the database computer or the corporate computer network, and the software used to reach the cloud. The back end provides software, devices, servers, and data storage that build a cloud of services.

Comparative Evaluation

The three common model of cloud service:

- Infrastructure as a Service (IaaS)-It allows the user to build and control the hardware of user applications as a scalable Cloud service. Example: Microsoft Azure, Google Compute Engine (GCE).
- Platform as a Service (PaaS)-This service consists of a language execution programming environment, operating system, web server and database. This creates environment where user build, compile and run program without worrying. Example: Google app engine, Windows azure.
- Software as a Service (SaaS)-Instead of purchasing a license for different applications, SaaS's users frequently hire the software and use it on an Internet browser. Example: Google docs, Gmail, and Microsoft office 365.

A combination of IaaS, PaaS and SaaS is used in both Amazon Web services and Microsoft Azure, while a server-less platform is Google cloud IaaS and PaaS. Virtual Machine (VM) instance types offered by Amazon Web Services is virtual server, storage, databases and networking. An instance is a Google infrastructure virtual machine (VM). The Google Cloud Console, the G-cloud command-line tool or the Compute Engine API allows you to build an instance. Microsoft Azure supplies and classifies different types of Virtual Machine (VM) based on memory, storage, and device types. We need to first review our app and workloads and can then pick a VM machine based on the available types if we want to build a virtual machine in Azure Cloud.

AWS Storage Services: (1) Simple Storage Service (S3) (2) Elastic Block Storage (EBS) (3) Elastic File System (EFS) (4) Storage Gateway (5) Snowball (6) Snowball Edge (7) Snowmobile Azure. Storage Services: (1) Blob Storage (2) Queue Storage (3) File Storage (4) Disk Storage (5) Data Lake Storage Google Storage Services: (1) Cloud storage (2) Persistent disk (3) Transfer appliance (4) Transfer service.

Google cloud, Amazon web services and Azure support several generation of Linux OS and in addition google cloud also supports windows operating system. The security model of AWS is called isolation where users have access limitation to service. Sometimes, these limitations matter according the region and users account type. AWS has less security issue comparative to AZURE. Azure also has issues with actual coherence, availability and documentation. It looks like users are secured but in real time users' activity get exposed to the internet. Finally, Google cloud service has a centralized approached to cloud security with better management than Azure, it also has many built in tools.

Performance and Scalability: AMAZON EC2 able to monitor the current availability and health status of the EC2 instances, troubleshoot problems through the Root Cause Analysis (RCA) window and know what portion of the instance's CPU is being utilized, the network traffic statistics and disk read/write operations. AZURE has optimized performance with cost control. We can maximize the full range of CPU, GPU, FPGA, and fast interconnect capabilities to reduce job completion times from days to minutes. It cut the queue. Each team can access their own scalable, tailor-made cluster to reduce queue times for large-batch workloads and relieve compute resource limitations. We pay only for what we need. We can access custom machine configurations to control costs with committed and sustained use discount and get up to 80% cost savings with Pre-emptible VMs. Both AWS and Azure have rates nearly 6 times the Google average. For all three providers, monthly requests appear to be the same, since Google supplies two million free requests but charges \$0.40 per million requests, making its rates comparable to AWS and Azure.

Auto scaling/Elasticity: Amazon EC2 auto scaling helps us maintain application availability and allows us to automatically add or remove EC2 instances according to conditions we define. Dynamic scaling responds to changing demand and predictive scaling automatically schedules the right number of EC2 instances based on predicted demand. Dynamic scaling and predictive scaling can be used together to scale faster. Auto scaling offered by google cloud let us automatically add or delete virtual machine (VM) instances from a MIG based on increases or decreases in load. On the other hand AZURE uses auto scaling to scale down all of our virtual machines at night or on the weekend when nobody's around, and then have them ready to go Monday morning when we come in to work. The cloud is built to be elastic so we can be as cost-effective as possible.

Monitoring tools/service provided:

SERVICES	aws	Azure	Google Cloud Platform
Virtual Servers	Elastic Cloud Compute	Virtual Machines	Google Compute Engine
Serverless Computing	Lambda	Azure Functions	Cloud Functions
Kubernetes Management	Elastic Kubernetes Service	Kubernetes Service	Kubernetes Engine
Object Storage	Simple Storage Service	Azure Blob	Cloud Storage
File Storage	Elastic File Storage	Azure Files	Filestore
Block Storage	Elastic Block Storage	Azure Disk	Persistent Disk
Relational Database	Relational Database Service	SQL Database	Cloud SQL
NoSQL Database	DynamoDB	Cosmos DB	Firestore
Virtual Network	Virtual Private Cloud	Azure VNet	Virtual Private Network
Content Delivery Network	CloudFront	Azure CDN	Cloud CDN
DNS Service	Route 53	Traffic Manager	Cloud DNS
Authentication and Authorization	IAM	Azure Active Directory	Cloud IAM
Key Management	KMS	Azure Key Vault	KMS
Network Security	AWS WAF	Application Gateway	Cloud Armor

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Opinion

Based on the comparative analysis written above, we have narrowed down our opinions based on the advantages and disadvantages of the different types of cloud platforms.

Amazon EC2

Amazon EC2 tops it off with the overwhelming scale and range as an Amazon market leader. The tools and technologies provided also dominates all, when it comes to its scope and broadness. Amazon EC2 pricing is the hardest to perceive, given that their large-scale archival preservation is particularly cost-effective.

Google Cloud Platform

Google Compute is the hallmark of their service portfolio. Google sticks out for providing a way for advanced technology to operate on ones' budget. Storage options are where Google is missing, mostly due to the shortage of backup options. Google Cloud has a good start, but they still have a way to go if they want to keep up with AWS.

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I would probably go to Microsoft Azure if I set up an enterprise because I am a developer and more willing to do so with Azure's Windows OS. It's also the best choice for me and for the first time I'll move to the cloud. Microsoft's rapidly scalable and also function rich cloud will help users tackle the legacy data center environment, says TechCrunch's John Sutter. It will be a great asset for users that migrates to the cloud for the first time, especially if their business applications are Windows-based.

Conclusion

Cloud computing is an Internet-based computing solution where shared services are provided. It allows the use of cumulative device capital, negating the need to delegate hardware to a mission. Cloud computing enables rapid scaling up or down at any time without a long-term commitment. Security and privacy are the primary issues voiced by many who migrate to the cloud. The cloud computing architecture consists of the front end and the back end.

In this innovative era, cloud computing will provide companies with the means and methods required to ensure financial flexibility and high-quality operation. There must, of course, be global collaboration if the cloud infrastructure phase is to achieve maximum security and general operating requirements. With cloud computing, we all need to be primed for the revolution.

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