APLUS

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MASTERS THESIS APPROVAL FORM

We certify that we have read the project of Tongjie Yu, Mengqiu Wu, Milin Dalwadi and Xing Fan entitled THESIS TITLE and that, in our opinion; it is satisfactory in scope and quality as the thesis for the degree of Master of Business Administration at Alliant International University.

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Dedication and Acknowledgements

Each member of group two contributed their own achievements. Hope it can help those who do research report in the future. This research is to our friends and family, and to those who will do research in the future.

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Abstract

Our report focuses on a cloud computing service called APLUS. As a start-up, APLUS has limited funding for cloud services. Cloud services, on the other hand, are what we desperately need. Therefore, APLUS needs cloud services that are reasonably priced and cost effective. According to the service platform provided by APLUS, we conducted research and comparison, and found that amazon website service is cheaper than Google cloud platform. AWS and GCP have many common services, but they offer different pricing models for customers. Our research covered a number of issues related to AWS and GCP's price, value, and storage space. The conclusion of this study proves that our hypothesis is wrong and helps APLUS company play a significant role in choosing cloud service platforms.

CHAPTER 1

Introduction

APLUS is a neutral, secure cloud computing service platform that is neutral and does not engage in customer business areas. The company works independently to develop a series of cloud computing products such as big data circulation platforms and AI service platforms and to deeply understand the business needs of the Internet and traditional enterprises in different scenarios. It provides comprehensive integration of public cloud, private cloud, hybrid cloud, and proprietary cloud services.

Problem Statement

Rizwan (2018) shows the huge benefits of company using cloud services. APLUS was facing storage problems due to the enormous amount of data provide by the new customers and decided to look for a cloud service that could help them solve their problems. However, APLUS is a new company that has just been established. They have limited funds for cloud services, but they need to acquire them urgently. Consequently, APLUS needs an affordable cloud service that can provide good cost performance.

Background and Need

APLUS company has just been established, deeply cultivating the needs of users, adhering to the concept of rapid customization and on-demand service, and launching products and services suitable for industry characteristics. The business covers internet, finance, new retail, manufacturing, education, government, etc. many industries.
As APLUS enroll with more users, they require bigger cloud capacity. The company currently using 15 desktop computers and 3 laptops to run and store their business. But

when the more data needs to be kept, online cloud service will be a better choice rather than local storage. As a result, APLUS going to work with one of the website services between Amazon Website Service (AWS) and Google Cloud Platform (GCP).

Hypothesis

Amazon Website Service is less expensive than the Google Cloud Platform for Software as a Service (SaaS) and Storage services needed by APLUS.

Research Questions

- What is the price of the service from Amazon Website Service (AWS) and Google Cloud Platform (GCP)?
- What is the service provided by AWS and GCP in detail, which one is more valuable?
- If the price and the service provided by AWS and GCP were somehow the same, which provides more storage?

Limitations

As English is our second language, Grammar became a huge problem while completing the paper. As a researcher, lacking the time for the paper as we only got 5 weeks to complete the paper. All of us in the group not familiar with IT and the company used in this paper. How do companies use limited funds to analyze and compare the value of the two companies? Will the selected company meet the requirements of our company?

Delimitations

As we do research and comparison, the system will consume our more money, and we may have to reduce some of the data. Something unexpected will happen during our

investigation. How will we deal with it? When we compare these two company of Google Cloud and Amazon Cloud, our company need our do more research on other company, but this will cost our more money under limited funds.

Summary

The purpose of this paper was to help APLUS to generate the best purchase decision between AWS and GCP. This paper will be an experimental research study that look for the cost performance and the price in different services provided by AWS and GCP. We assume that AWS is less expensive than GCP with the same cost performance. And in the following chapters, we will conduct research and compare various data between AWS and GCP, conclude and proof our hypothesis.

CHAPTER 2

Review of the Literature

Introduction

Cloud computing is the most trending keyword today. To choose which services are beneficial for the IT industry, Amazon Website Service (AWS) and Google Cloud Platform (GCP) have a variety of options available from which a customer can choose. AWS and GCP are among the top cloud computing industries. Both service providers offer many services. Some of these are common in AWS and GCP. AWS offers better functionality in the hybrid cloud while GCP provides open sources which help developers to develop in their own way. Moreover, different cloud service providers give better opportunities to companies who are looking for reliable and cost-effective services.

Benefits and Features of Google Cloud

Nemer (2019) stated that Anthos is a new platform that helps in repackaging Google's well adapted multi-cloud Kubernetes. Google Cloud can help their customers to make their applications modern and compatible across any public or private cloud platform. For newer startups, this is beneficial as it helps them to move more quickly without concern for legacy code.

Carey (2019) stated that Google offers a cloud machine learning engine which helps engineers who are into machine learning and who can build models based on its open source learning library. The Google cloud platform is quick to boot and comes with persistent disk storage which is good in performance and highly customizable depending on customer needs.

Forrest (2019) stated that Google Cloud Platform is a public cloud provider, and it is expanding into hybrid and multi cloud platforms. Anthos can help the users to manage their workloads on GCP and Google Kubernetes Engine (GKE). Moreover, Google follows a lower pricing model for the different services.

Benefits and Features of AWS

Nemer (2019) stated that AWS offers valuable storage space for markets and for marketing leaders, and it is constantly updating all its resources and services. AWS has an extremely impressive server type which offers an extension into hybrid cloud functionality through VMware Cloud on AWS. AWS also offers the possibility of a huge contract with the U.S. Government.

Goyal (2019) stated that AWS is a secure and durable technology platform. AWS has layers of physical and operational security to ensure the safety and integrity of the data that is stored. It also provides documentation on how to deploy security features. It ensures the availability, integrity, and confidentiality of the data.

Different Cloud Service Provider in the market

Dignan (2018) stated that choosing to use public cloud storage is becoming easier as many companies are providing multiple services which are useful for any company looking for cloud services. Most company managers are aware of AWS, GCP, Microsoft Azure, and IBM Cloud. However, choosing which provider is suitable for an organization depends on the requirements of the company.

Dignan (2018) stated that when it comes to enterprise adoption, AWS and Microsoft Azure are major public cloud providers. Figure 1 below shows that AWS and

Microsoft Azure are going hand in hand while GCP is still working to make a place for itself in the market.

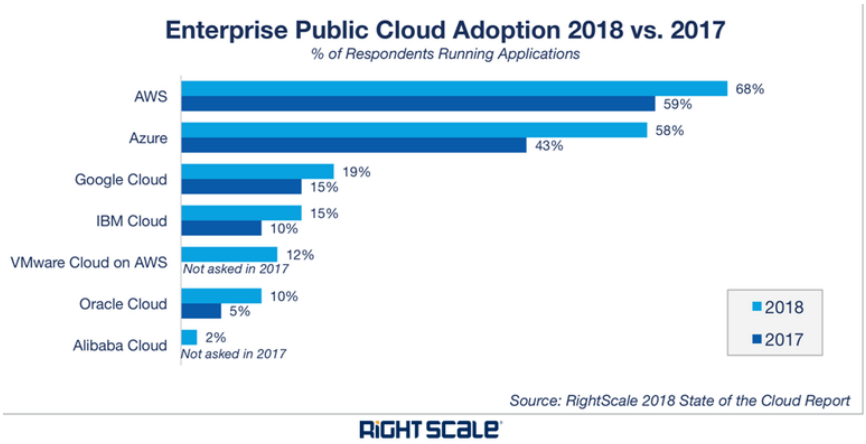

Figure 1. Enterprise Public Cloud Adoption.

AWS and Microsoft Azure are among the top cloud platforms when it comes to adapting their services for a customer's organization. However, when it comes to the market share, AWS is losing.

Figure 2 shows that the GCP market share from 2015 to 2020 is four times larger, having increased from 4% to 15%. Also, Microsoft Azure growth has doubled from 14% to 28%. The AWS market share has declined from 82% to 57%, which is significant.

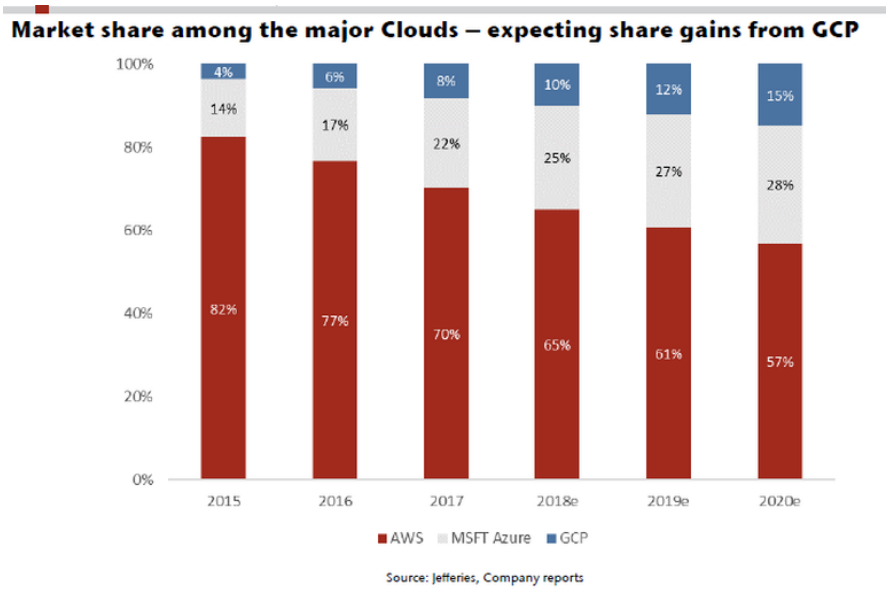

Figure 2. Market share among the major clouds.

Services Provided by AWS and GCP

Computer Services

Figure 3 shows that the difference about PaaS, IaaS, Containers, and Serverless Functions of the Google Compute Engine (GCE) and Amazon Compute Cloud (ACC).

IaaS	Google Compute Engine	Amazon Elastic Compute Cloud
PaaS	Google App Engine	AWS Elastic Beanstalk
Containers	Google Kubernetes Engine	Amazon Elastic Compute Cloud Container Service
Serverless Functions	Google Cloud Functions	AWS Lambda

Figure 3. Computer Services.

Network Services

Figure 4 shows that the Load Balance, Peering, and DNS between the Google Cloud and Amazon Cloud.

Load Balancer	Google Cloud Load Balancing	Elastic Load Balancer
Peering	Google Cloud Interconnect	Direct Connect
DNS	Google Cloud DNS	Amazon Route 53

Figure 4. Network Services.

Figure 5 shows that the storage between Google Cloud and Amazon Cloud.

Storage Services

Object Storage	Google Cloud Storage	Elastic Load Balancer
Block Storage	Google Compute Engine Persistent Disks	Amazon Elastic Block Store
Cold Storage	Google Cloud Storage Nearline	Amazon Glacier
File Storage	ZFS / Avere	Amazon Elastic File System

Figure 5. Storage Services.

Figure 6 below shows that two kinds of database between of Google Cloud and Amazon Cloud.

Database

RDBMS	Google Cloud SQL	Amazon Relational Database Service
NoSQL: Key-value	Google Cloud Datastore Google Cloud Bigtable	Amazon DynamoDB
NoSQL: Indexed	Google Cloud Datastore	Amazon SimpleDB

Figure 6. Database.

Bid Data and Analytics

Figure 7 below shows that the differences of Bath Data Processing, Stream Data Processing about Google Cloud and Amazon Cloud.

Batch Data Processing	Google Cloud Dataproc Google Cloud Dataflow	Amazon Elastic MapReduce
Stream Data Processing	Google Cloud Dataflow	Amazon Kinesis
Stream Data Ingest	Google Cloud Pub/Sub	Amazon Kinesis
Analytics	Google BigQuery	Amazon Redshift

Figure 7. Big Data and Analytics.

Management Services

Figure 8 shows that the Monitoring and Deployment of the Google Cloud and Amazon Cloud.

Monitoring	Stackdriver Monitoring	Amazon CloudWatch
Deployment	Google Cloud Deployment Manager	AWS CloudFormation

Figure 8. Management Services.

Keshari (2018) stated that above are some of the common services provided by both the AWS and GCP platforms. When it comes to services, AWS is ahead of GCP, as AWS provides way more services than GCP. The services offered by AWS are very well integrated, and AWS provides very comprehensive cloud services.

Moreover, the Google Cloud Platform is a bit ahead when it comes to pricing. Figure 9 shows that for GCP a single instance deployment of 2GB RAM cost $50 per month over a three-year period whereas AWS the single instance deployment is priced at $69 per month over a three-year period.

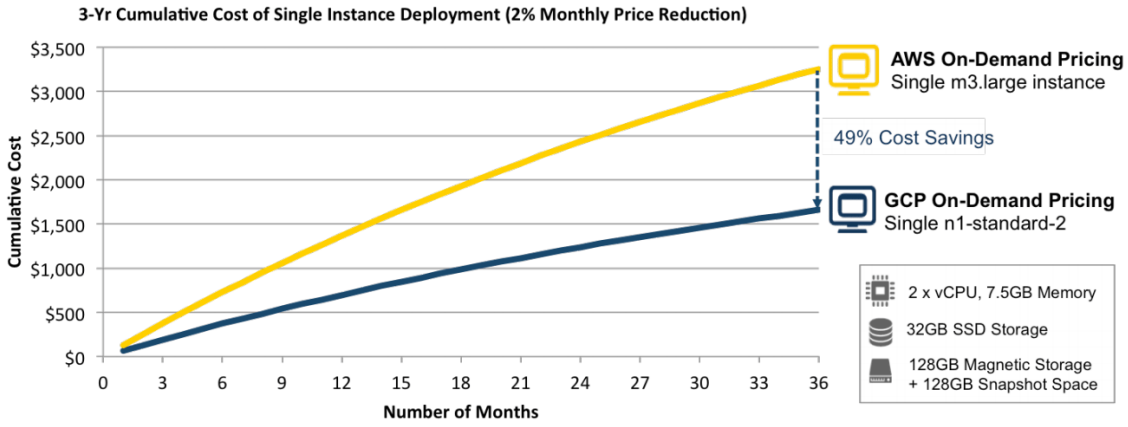

Figure 9. Cost for Services.

One can save more as billing for AWS is done on an hourly basis while GCP's is billed on a per second basis. Along with this, GCP offers additional discounts for long term usage and no upfront costs. Also, both of these companies provide free trials for 12 months. AWS has different pricing for different services while GCP provides $300 worth of credit that can be used for any services. GCP has very interesting features which is free tier. For this, there is no time limit, so people can run small instances which will cost less.

Summary

Cloud computing is becoming more reliable and cost effective. The competition among cloud service providers depends on the services provided and their costs. AWS and GCP have many common services, but they have different pricing models for their customers. When it comes to services, AWS is leading ahead of GCP and provides better services for its customers. In contrast, GCP is leading when it comes to pricing. It provides a 49% cost saving compared to AWS. When it comes to market share, AWS is leading, GCP is making good progress but needs to work more.

CHAPTER 3

Research Methodology

Introduction

In this chapter, the research methodology used in the study is described. The AWS and GCP cost performance, service and value where the study will be conducted, the details for the various feature will be listed and the results will be compared. The instrument used to collect the data, including methods implemented to maintain validity and reliability of the instrument are described.

Research Method(s) Employed

There are two research methods that are common to all kinds of research. The first is the qualitative research. Qualitative Research is primarily exploratory research. It is used to gain an understanding of underlying reasons, opinions, and motivations. It provides insights into the problem or helps to develop ideas or hypotheses for potential quantitative research. Qualitative Research is also used to uncover trends in thought and opinions, and dive deeper into the problem. Qualitative data collection methods vary using unstructured or semi-structured techniques. Some common methods include focus groups (group discussions), individual interviews, and participation/observations. The sample size is typically small, and respondents are selected to fulfil a given quota.
The second is the quantitative research. Quantitative Research is used to quantify the problem by way of generating numerical data or data that can be transformed into usable statistics. It is used to quantify attitudes, opinions, behaviors, and other defined variables and generalize results from a larger sample population. Quantitative Research uses measurable data to formulate facts and uncover patterns in research. Quantitative data

collection methods are much more structured than Qualitative data collection methods. Quantitative data collection methods include various forms of surveys – online surveys, paper surveys, mobile surveys and kiosk surveys, face-to-face interviews, telephone interviews, longitudinal studies, website interceptors, online polls, and systematic observations.

The researcher will apply quantitative research to study between Amazon Website Service (AWS) and Google Cloud Platform (GCP). We are going to make a research based on the hypothesis which researcher mentioned before. The researchers will collect data on AWS and GCP for the study. The data is quantified and the results in the sample are presented.

Specific Procedures Employed

The quantitative approach was defined by Bums and Grove (2005:23) as a formal, objective, systematic process to describe and test relationships and examine cause and effect interactions among variables. Document review and Interviews may be used when collecting data from AWS and GCP to generate the required information needed in this paper. A document review discovery the information shown on the surface that provided by both AWS and GCP on this official website. And Interviews through customer service, phone calls and walk in interviews able to generate information needed that didn't provide on the surface.

Formats for Presenting Results

Researchers will be presenting results by both textual method and the tabular method in the next chapter. First, researchers will arrange and provide this information gathered by asking questions, describing problems and identifying the specific areas of

interest in written form. Afterwards, researchers will generate this information in a more precise, systematic and orderly way in table form (Zhang, 2008). This format provides readers with the data in a simplified form.

Format:

1) Amazon Website Service:

Services - SAAS and STORAGE

2) Google Cloud Platform:

Services - SAAS and STORAGE

3) Compare

Resources Used

In this research article, resources will be provided and used from these three components: APLUS, AWS, and GCP. Researchers will be required to gather information from the company APLUS in order to determine their current status, needs, and limitations. Researchers will also link with AWS and GCP customer services to gather information on their prices and services. With these resources, researchers can effectively compare their cost performance and determine which ones are more suitable for APLUS in their current state.

Summary

This methodology research article describes the cloud services by quantitative approach with two different methods, Document review and Interviews. The first methods generate an overall information provided by AWS and GCP, and the second methods uses to perfection the data required. In addition, the article describes the use of basic methods and specific procedures. The article also describes the format of the

display results and the resources used, which gives a further understanding of this methodology.

CHAPTER 4

Results

Introduction

Cloud platforms play a vital role in today's world. Developing in the cloud gives an advantage to the users by allowing them to get their applications out in the world quickly. Also, the maintenance cost is reduced as hardware failures do not result in a total loss of data. As known, there are many organizations that provide cloud services. The user has the liberty to choose from the provided options based on requirements. However, the main and the most important requirement is security and also performance.

Findings

The Google cloud platform is essentially made up of many different services and solutions that allow users to use the same software and hardware infrastructure that Google uses for its own products, such as YouTube and Gmail. Google uses launched their first service, the Google application engine, in 2008 (Singh, 2019).

Google App Engine

Google Container Engine

Google Cloud Big Table

Google Big Query

Google Cloud Functions

Google Cloud Datastore

Google Storage

Google Cloud CDN

Google Cloud DNS

Amazon web services (AWS) is a subsidiary of Amazon.com, which was founded in 2006 to provide cloud computing services to businesses and individuals. Like the Google cloud platform, they have a number of different services and solutions. Amazon certainly paved the way for cloud computing! The researchers suggest users check out the TechCrunch article on how AWS came to be (Singh, 2019).

Amazon Elastic Computer Cloud (Amazon EC2)

AWS Elastic Beanstalk

Amazon EC2 Container Service

Amazon DynamoDB

Amazon Redshift

Amazon Lambda

Amazon DynamoDB

Amazon S3

Amazon Cloud Front

Amazon Route 53

Block Storage

AWS and Google have a 99.95% availability whereas Azure offers up to a 99.99% availability service-level agreement (SLA) in some settings for its block storage service (Butler, 2019).

Block Storage - SSD

	AWS	Azure	Google
Service Name	General Purpose and PIOPs SSD	Premium	SSD
Volume Sizes	1GB to 16TB 4GB to 16TB for PIOPs	1GB to 1TB	1GB to 64TB
Max IOPs per volume	10,000 (20,000 for PIOPs)	5000	40,000 read, 30,000 write
Max Throughput per volume (MB/s)	160 (320 for PIOPs)	200	800 read, 400 write
Replication	Within the AZ (essentially RAID-1)	LRS – multiple copies within datacenter	Built-in redundancy
Notes	Max IOPs of 65,000 per instance		

Figure 10. Block Storage-SSD.

One of the most important factors to consider when buying block storage is how fast you need access to the data stored on the SSD disk. For that, the vendors offer different guaranteed rates for IOPs. Google is in the lead here. The company offers 40,000 IOPs for reads and 30,000 for writes to its disks. AWS's general purpose SSD offers 10,000 IOPS, but its provisioned IOPs offering can offer up to 20,000 IOPs per volume, with a maximum IOPs of 65,000 per instance. Azure offers 5,000 IOPs.

Google not only has the highest IOPs, but also gives customers the most choice in the size of block storage volumes. For more traditional hard drive-based storage, Google offers volume sizes ranging from 1GB to 64TB. AWS offers volumes between 500GB to 16TB. Azure offers between 1GB and 1TB volume sizes. As with the SSDs, Google offers the highest level of IOPs-per-volume in HDDs at 3,000 for reads and 15,000 for writes. AWS and Azure are at 500 max IOPs per volume. Max throughput ranges from

Azure are 60 MBPs to Google at 180 for reads and 120 for writes, and AWS at 500 MBPs.

AWS offers two options for HDDs. The first option is Throughput Optimized volumes which are designed for frequently accessed throughput-intensive workloads. The second option is Cold HDDs which are the lowest cost per GB of EBS volume types and are meant for less-frequently accessed large, cold datasets. AWS also offers a series of EBS-optimized EC2 virtual machine instances to be used with these block storage offerings.

Pricing is a bit complicated as all prices are per GB/month. However, for HHD, AWS starts at $0.045. For Google it is $0.04, and for Azure, it is $0.03 (Butler, 2019). SSD pricing starts at $0.10 in AWS, at $0.17 for Google, and at between $0.12, and 0.14 for Azure, depending on the size of the disk.

In a pricing analysis done by Right Scale, the company found that generally the pricing structure means that Azure has the best price/performance ratio for block storage. However, for workloads that require higher IOPs, Google becomes the more cost-effective option.

Object Storage

Object storage is the service for users. Again, the cloud providers have different types of storage, classified by how often the customer expects to access it. Hot storage is data that needs to be almost instantaneously accessible. Cool storage is accessed more infrequently, and cold storage is archival material that is rarely accessed. The colder the storage, the less expensive it is.

AWS's primary object storage platform is Simple Storage Service (S3). It offers Standard-Infrequent Access for cool storage and Glacier for cold storage. Google has Google Cloud Storage, GCS Nearline for cool storage and GCS Cold line for archival. Azure has only the hot and cool options with Azure Hot and Cool Storage Blobs. Customers have to use the cool storage for archival data. AWS and Google each have a 5TB object size limit whereas Azure has a 500TB per account limit. AWS and Google each publicize 99.99% durability for objects stored in their cloud. This means that if users store 10,000 objects in the cloud. AWS says that on average, one file will be lost every 10 million years. The point is these systems are designed to be ultra-durable. Azure does not publish durability service level agreements.

Object Storage - Overview

	AWS	Azure	Google
Service Name	S3	Azure Storage (Blobs)	Google Cloud Storage
Availability SLA	99.95%	99.99%	99.95%
Hot	S3 Standard	Hot Blob Storage	GCS
Cool	S3 Standard – Infrequent Access	Cool Blob Storage	GCS Nearline
Cold (Archival)	Glacier	Use Cool Blob Storage	GCS Coldline
# Object Limits	Unlimited	Unlimited	Unlimited
Size Limit	5 TB/Object	500 TB/account	5TB per object

Figure 11. Object Storage- Overview.

Pricing on object storage is slightly more complicated because customers can choose to host their data in a single region, or for a slightly increased cost, they can back

it up across multiple regions, which is a best-practice to ensure that users have access to their data if there is an outage in a region.

In AWS, all prices for S3 are $0.023 in GB/month. To replicate data across multiple regions costs twice as much: $0.046, plus a $0.01 per GB transfer fee. AWS's cool storage service, named S3 Infrequent Access (IA) is $0.0125, and its cold storage/archival service Glacier costs $0.004. Customers can pay different amounts for faster or slower retrieval times for objects from Glacier, ranging from one to five minutes, or up to five to 12 hours.

Google has the most analogous offerings. Its single-region storage costs $0.02, while multi-region storage is $0.026, with free transfer of data. The company's cool storage platform named Nearline is $0.01, and the cold/archival product named Cold Line is $0.007. Google says data retrieval from Cold Line is faster (within milliseconds) than in Glacier, which AWS says could take between minutes and hours.

Azure offers single-region storage for $0.0184, and what it calls *Globally Redundant Storage* for $0.046. However, it is read only, which means users cannot write changes to it. Doing so, costs more money. Azure's cool storage named Cool Blob Storage is $0.01. Azure does not yet offer a cold or archival storage platform, so customers must use Cool Blob storage for these uses.

File Storage

An emerging use case is the use of a cloud-based file storage system. Think of this as a cloud-based version of a more traditional Network File System (NFS). Users can mount files to the system from any device or VM connected to it and then read and

retrieve files. This is a relatively nascent cloud storage use case, and therefore, offerings are not yet as full featured compared to block and object storage (Adler, 2019).

AWS's offering in this category is named Elastic File System. It emerged from beta in June 2016 and allows users to mount files from AWS Elastic Compute Cloud (EC2) virtual machines within a virtual private cloud or to mount them from on-premises services using AWS Direct Connect or a virtual private connection (VPC). There is no size limit, so it scales automatically based on need and offers a 50 MB per second throughput per TB of storage. Customers can pay for up to 100MBps throughput. Prices start at $0.30/GB/month.

Azure offers Azure File Storage, which is similar in nature but has a capacity of 5TB per file and 500TB per account, and it requires manual scaling. It offers a 60MBps throughput for reading files (Butler, 2019).

File Storage - Overview

	AWS	Azure	Google
Service Name	EFS	Azure File Storage	GCS + FUSE adapter
Storage size	Scales elastically to petabytes	5TB per file share, 500TB per storage account	
Scaling	Automatic	Manual	Manual
Attach to multiple VMs	Yes	Yes	One read/write volume and many read-only, or NFS, or SMB, or Gluster
Replication	Multiple AZs in the region	LRS or GRS	Built-in redundancy
Throughput	50MB/s (burst to 100) per TB of storage	60MB/s per file share	180 MB/s read, 120 MB/s write
On-premise support	NFS v4.1	SMB 3.0	NFS, SMB
Backup	Use 3rd party tools, AWS Data Pipeline, sync to EBS +snapshot.	Azure Backup	Snapshots
Encryption at rest	No (future)	SSE in Preview	Yes

Rightscale

Figure 12. File Storage- Overview.

Google does not have a native file storage offering. Instead, it offers the open source FUSE adapter, which allows users to mount files from Google Cloud Storage buckets and converts them into a file system. Google claims this provides the highest throughput of the three providers with 180MBps on reads and 120MBps on writes. Adler (2019) said that in his experience, the FUSE adapter is not as well integrated into Google's cloud platform as the other two offerings, which means it can be frustrating for user. Adler also notes that AWS's EFS does not have a native backup solution whereas Azure does. AWS encourages EFS users to rely on third-party backup tools at this point.

Azure and Google offer lower prices for their file storage systems than AWS does. Azure charges $0.80 per GB/month, and Google charges $0.20. However, Adler (2019) says these costs do not take into account any replication or transfer charges. While AWS's base price may seem higher when taking into account all that it factors in related to scaling, it could be a wash between the three providers.

Summary

Amazon and Google are the two major organizations that provide cloud services to users. Both are successful in satisfying users' needs in their own way. However, there are a few areas where Google is doing much better than Amazon in serving its users. The cloud is a service that users use believing that their data is secure and will not be tampered with or accessed. In addition, the performance of cloud service is important as the success of the application depends on how easy and fast the data is allowed to be accessed by the application user. Google has advantage in these areas when compared to

Amazon. According to the findings of this study, Google cloud services are more suitable for the APLUS company to use.

CHAPTER 5

Conclusion

Introduction

AWS is ahead of GCP in providing better service to customers. GCP, by contrast, is the leader in pricing. Compared with AWS, it saves 49% of the cost. In terms of market share, AWS is in the lead and GCP is making good progress, but there is still working to be done.

Conclusions

Researchers by comparing the data of amazon web services and Google cloud platforms, the researcher summarized the service and cost of the two platforms in chapter two with the methodology of chapter three, and the storage space in chapter four and the price of storage space, so as to verify our hypothesis. Here's what we came to. In terms of services, AWS is ahead of GCP and provides better services for customers. GCP, by contrast, is the leader in pricing. Compared with AWS, it saves 49% of the cost. In terms of market share, AWS is in the lead and GCP is making good progress, but there is still working to be done. This conclusion proves our hypothesis wrong.

Hypothesis is Amazon Website Service is less expensive than the Google Cloud Platform for Software as a Service (SaaS) and Storage services needed by APLUS.

The conclusion is GCP, by contrast, is the leader in pricing. Compared with AWS, it saves 49% of the cost.

Implications

The researchers applied quantitative studies using measurable data to compare studies between amazon web services (AWS) and Google cloud platform (GCP).

Researchers are going to look at it based on the hypothesis that they mentioned earlier. The researchers will collect AWS and GCP data for the study. The data are quantified that the results of the sample are given. This study reached a strong conclusion through pricing, storage space and usage ratio of the two service platforms, which successfully helped APLUS solve the problem of choosing cloud service platform. This is a very positive impact for APLUS company.

Recommendations for Future Research

Researchers have applied methodology, which includes quantitative research and qualitative research, both of which are very effective. The researchers completed the study with a series of quantitative data. In this regard, the researchers suggest that in future studies, more research methods and more argumentation methods are needed. In the research, there will always be different conclusions from the hypothesis, which is a normal research phenomenon. The researcher hopes that other researchers will have enough confidence in future research, enumerate more research evidence, and better complete the research topic.

Summary

In conclusion, the researchers reached conclusions about the hypothesis. The conclusion proved the hypothesis wrong and helped APLUS solve the problem of choosing a platform server.

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