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1. Introduction

In our world of IT, I can say the term Cloud computing could be a developing and growing thought within the scientist of technology information, created out of our needs for computing on the go. It provides us to get information, store applications, and capacity that are not put away on our computer. For a straightforward cloud computing outline, it can be caught on as a conveyance framework that conveys computing the same way a control framework conveys power. To the normal computer client, it offers the advantage of conveying IT without the client having to have an in-profundity information of the innovation. Comparable to the way a customer can get to power without being a circuit tester. To the average computer user, it offers the advantage of delivering IT without the user having to have an in-depth knowledge of the technology. In our assignment report we have to contrast the most 3 types of cloud computing which take providers in consideration multiple aspects like the security, service model, pricing, and much more points. We also discussed the challenges faced by users that use cloud computing. Finally, we gave our opinion. This Report is written based on literature review report format.

2. Comparative Evaluation and differences

Subsequently, in our report, we fair progressing to take an outline of 3 of the foremost known cloud computing which comprises the greatest freedom for standards that included in the comparative assessment. In here we'll

make comparative assessment alludes to our a few inquire about in which assessment and the discoveries of the assessment handle will set in a comparative system.

2.1 Amazon EC2 (AWS) [1]

Amazon Elastic Compute Cloud (Amazon EC2) It might just be a web service and digital platform that point supports, configurable computing power. This was planned that simplify public internet cloud computing for developers. The simple web gain application of Amazon EC2 allows users to obtain and model skill with insignificant grinding. It gives more control of your computer resources and allows users to access in the proven cloud computing of Amazon.

2.1.2 Storage

Amazon EC2 offers versatile, cost-effective, and easy-to-use data storage solutions across those cases. There is an effective way of quality and longevity in each option. To suit your requirements, these storage solutions can be used individually or in combination.

the following:

Amazon EC2 instance store

Use Amazon EFS with Amazon EC2

Use Amazon S3 with Amazon EC2

these storage options include
Amazon Elastic Block Store

2.1.3 Virtual Machine

Clarify to this figure of point is that it can be obviously seen and notice that T2, T3, M4, M5, and M5d are the different instance types, each having varying sizing options that range from nano to 24xlarge.

2.1.3 Security:

The main priority is cloud security at AWS. You benefit from a data centre and network infrastructure as an AWS customer that is constructed to meet the requirements of the most security-sensitive organization. The AWS Cloud HSM is a cloud-based hardware security module (HSM) that enables you to easily generate and use your own encryption keys on the AWS Cloud.

2.1.4 OS Environment Offered:

Multiple Linux which based on distributions and Windows

2.1.5 Pricing models.

Amazon EC2 can be tried for free. For Amazon Web services, there are five ways to pay: On-Demand, Pension Savings, Reserved Instances, and Spot Instances. You can also pay for Dedicated Hosts on physical servers dedicated to your use that provide you with EC2 instance power. Visit the Amazon EC2 Cost and Power page for more detail about how to maximize your Amazon

Within those greater families are unique instance types. Here's a list of instance types for just the General Purpose Family:

- t2.nano, t2.micro, t2.small, t2.medium, t2.large, t2.xlarge, t2.2xlarge
- t3.nano, t3.micro, t3.small, t3.medium, t3.large, t3.xlarge, t3.2xlarge
- m4.large, m4.xlarge, m4.2xlarge, m4.4xlarge, m4.10xlarge, m4.16xlarge
- m5.large, m5.xlarge, m5.2xlarge, m5.4xlarge, m5.12xlarge, m5.24xlarge
- m6.large, m6.xlarge, m6.2xlarge, m6.4xlarge, m6.12xlarge, m6.24xlarge

EC2 spending.

2.1.6 Performance and Scalability

Accelerated Computation, Compute-optimized, General Purpose, Memory-Optimized, and Storage Optimized are classified by efficiency. AWS also offers Auto Scaling that allows you to set target usage levels in a single, intuitive interface for multiple resources.

2.1.7 Elasticity:

Helps you to adjust each a vailability of resources to production, that cost extra. Through operational cost, balancing needs for consumption is important. External use (number of clients visiting the website) and internal use are protected by request (application team using development and test environments). There are different sorts: time-based flexibility (because once assets are not being used, we switch a part) both density.

2.1.9 Monitoring tools: t there are SolarWinds® AppOptics™, SolarWinds Papertrail™, Zenoss ZenPack, Zabbix, and Weave Scope.

2.2 Azure

2.2.1 Service model:

The types of cloud computing are models of service implementation that allow you to choose the degree of control over your data and the types of services that you need to provide. There are three major types of cloud computing services that are built on top of each other, often referred to as the cloud computing stack. Infrastructure-as-a-service (IaaS), used for Internet-based access to storage and computing power, is the first type of cloud computing. The second type of cloud computing is the platform-as-a-service (PaaS), which gives developers the tools to build and host web applications, the most basic category of cloud computing types. Software-as-a-service is the third kind of cloud computing (SaaS), which is used for web-based applications.

2.2.3 Storage:

Microsoft Azure cloud object storage solution for storing large quantities of unstructured data, such as text or binary data, is Azure storage. Azure Storage is ideal for directly submitting photos or documents to the browser and storing files for distributed access.

2.2.2 Virtual Machines:

One of many forms of on-demand, significant computing services which Azure provides is Azure Virtual Machines (VM). When you need more control over the cloud computing than some of the other options offer, you usually choose to use a VM. In different ways, Azure virtual machines could be used. For instance, Azure VMs provide a fast and easy way to build a machine with unique configurations for creation and testing.

2.2.4 OS Environment Offered: Multiple Linux based distributions and Windows.

2.2.5 Security:

Developers understand whether security is a cloud-based task and then how critical it is to find precise and appropriate Azure intelligence information. Taking advantage of its broad range of security tools and capabilities is one of the best reasons to use Azure for your applications and services.

2.2.6 Performance and Scalability:

Scaling is the system's adaptability to the altered amount of workload or web application traffic. The ability to auto-scale according to the requirements of application use is one of the great features of the Azure service.

2.2.7 Pricing Model: Companies can save up to 60 percent on service costs by using Azure under a capacity reservation contract, depending on the capacity reservation defined compared to pay-as-you-go agreements.

2.2.8 Auto scaling / Elasticity:

Auto level is an integrated function of Cloud Providers, Mobile Services, Virtual Machines, and Websites that enables apps to perform their best when changes in demand are made.

2.2.9 Monitoring Tools/Service Provided:

Azure Sustainable practices users optimize ones software and services' speed and reliability. It provides a detailed remedy for flight data collection, analysis, and action from your cloud and on-site environments.

2.3 Google Computing [3] [4]

2.3.1 Service Model: As a PaaS service provider, Google Cloud has many facilities and services for its clients, such as computing and hosting, storage, databases, etc.

2.3.2 Virtual Machine: A machine type is a set of virtualized hardware resources available to a virtual machine (VM), including system memory size, virtual CPU (vCPU) count, and persistent disk limits. In Compute Engine, machine types are grouped and curated by families for different sets of workloads. Google cloud's clients choose from general-purpose, memory-optimized, and compute-optimized families.

2.3.3 Storage: Google allows its clients to use 15 GB of free Google online storage, with a paid subscription usually required if this volume is exceeded.

2.3.4 OS environment offered: Multiple Linux based distributions and Windows.

2.3.5 Security: Google Cloud has the same end-to-end security system, built-in protection, and global network Google uses to protect information, identities, applications and devices. It is transparent, as well as private, making it easier for users to control how their data is both used and shared with others.

2.3.6 Performance and Scalability: Google Cloud provides products and features to help build scalable, efficient apps like Compute Engine VM and Google Kubernetes Engine (GKE). Clusters integrate with auto-scalers allowing growth or reduction of resource consumption based on personally defined metrics. Since Google Cloud's serverless platform provides managed compute, database, and other services which scale quickly from zero to high request volumes, only what is used is paid for. Database products like Big Query, Cloud Spanner, and Cloud Bigtable can deliver consistent performance across even the biggest data sizes.

2.3.7 Pricing Models: Google cloud offers a variety of pricing models, such as Free, Subscription-based pricing, Usage-based pricing and Combined pricing, allowing for user choice.

2.3.8 Elasticity: Managed instance groups (MIG) offer autoscaling capabilities that let GCP's clients automatically add or delete virtual machine instances depending on increase or decrease in load. Autoscaling helps their apps handle increases in traffic smoothly and, at the same time, reduce costs when the need for resources is lower.

2.3.9 Monitoring tool: Cloud Monitoring provides endpoint checks to web applications and other internet-accessible services running in the user's cloud environment. Users are able to configure uptime checks associated with URLs, groups or resources, such as instances and load balancers.

4. Final Opinions

4.1 HASHED

I think there is no one stand out between all these 3 types of service providers. They're all doing good work. Microsoft Azure, Google Cloud, Amazon EC2, show a fabulous service. but in my overview, I will absolutely I would choose AWS to be my cloud service provider and the reason for that is because of the depth of services provided. For me this is the most important consideration. To guarantee that data is extremely safe, it provides several services with the best security for the user.

3. Challenges [5]:

In recent years Cloud computing has, unquestionably, become increasingly dominant. Widely used and popular as a solution for companies and organizations, there still remain some challenges around the issues of security, lack of expertise, level of expectation and the lack of controls.

4. Conclusion:

For many users Cloud computing has made a considerable difference in terms of benefits detailed in this report. Despite the issues and challenges, the particular strengths and weaknesses of an individual provider compared to another, there is the scope for the great majority of users to find the right fit. Where there are limitations or drawbacks exist, these are being addressed and are largely a question of what the user regards as the priority requirement and/or operational constraints.

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