Cloud Computing Services(AWS,AZURE,GCP)

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ABSTRACT: Cloud Computing is able to store data virtually, making it easier for users without having to provide storage devices such as hard drives. Cloud computing is the on-request supply of computing resources through the Web with pay-as-you-use billing. Instead of purchasing, operating, and maintaining physical computers, hardware, and servers, cloud solutions providers such as Microsoft Azure of Microsoft, Amazon Web Services (AWS) of Amazon, and Google Cloud Platform (GCP) by Google offer cloud solutions such as processing power, memory, and databases on an as-needed basis. This top three cloud platform service providers along with basic pricing schemes of Amazon webservices, Microsoft Azure and Google cloud platform. These platforms allow customers to focus on business rather than technical aspects. The thing is that all three platform have in common are on demand services, flexibility, support and security.

KEYWORDS: Amazon Web service, Google cloud Platform, Microsoft Azure, Cloud Computing, Cloud Computing Services(IAAS,PAAS,SAAS).

INTRODUCTION:

In today world cloud computing has become one of the major leading technologies. The benefits of cloud have direct impact on services providers and customers. Cloud computing has become a preferred option in information system because it can optimize, organize and maintain software services and hardware across the internet. The use of this technology has allowed companies to reduce costs of maintenance and support. In addition, the companies reach an efficient and flexible use and of hardware and software resources on demand.

CLOUD COMPUTING:

The Cloud computing services reshape the world of Information Technology. Not only IT companies but also other business organizations and individual's leverages cloud computing technology. The more core concept of cloud computing is to provide users with computing services in a pay-per-use fashion [1]. Cloud allows users to use a shared pool of computing resources. These resources are hardware-based; they include Software, network, platform, and many other valuable resources. The demand for cloud services have increased rapidly in recent years result in major boom in cloud platform user's scalability. In today world cloud computing has become one of the major leading technologies [2]. Cloud computing is a flexible internet usage model, convenient, on demand, fast access with configuration and integrated systems (for example, networks, servers, storage, applications, and services) that can quickly store and provide data for service centres. The use of this technology has allowed companies to reduce costs of maintenance and support. The companies reach an efficient and flexible use and hardware and software resources on demand. The cloud divided into 3 main areas: Public, Private, Hybrid. Public: as a service offered for general users with the ability to store, use hardware resources and execute software application with restrictions. The cloud could be free or with a fee. Private: enterprise have the control of the hardware and software resource and they are able to enable them on demand. Hybrid: a mix of the two precedent areas.
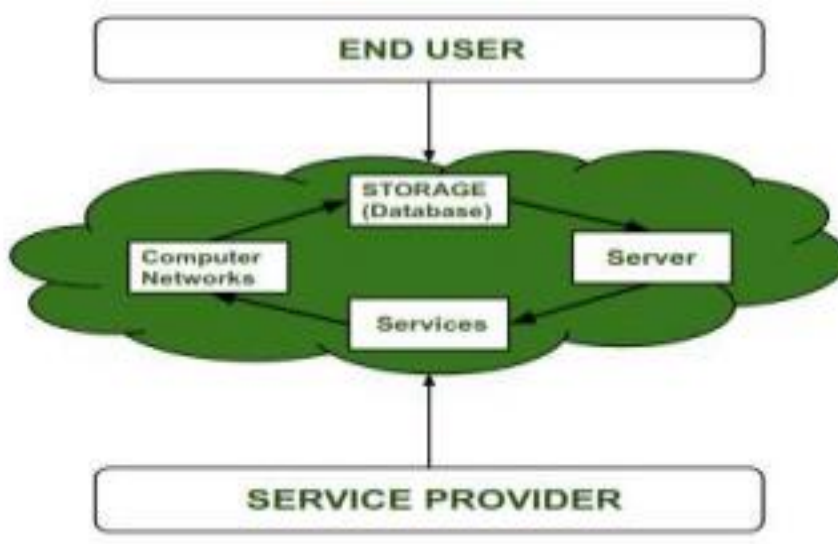
FIGURE 1. Cloud Computing

CLOUD SERVICE PROVIDERS:

The demand for cloud services have increased rapidly in recent years result in major boom in cloud platform user's scalability. The benefits of cloud have direct impact on services providers and customers. The companies like Microsoft, Google, Amazon, IBM, Oracle, Version, Rackspace has regularly change pricing scheme to provide more customer friendly service. Cloud service platforms prove variety of services including storage, upload and Download. Cloud computing has changed the way of storing and managing data from traditional approach to new cloud approach.
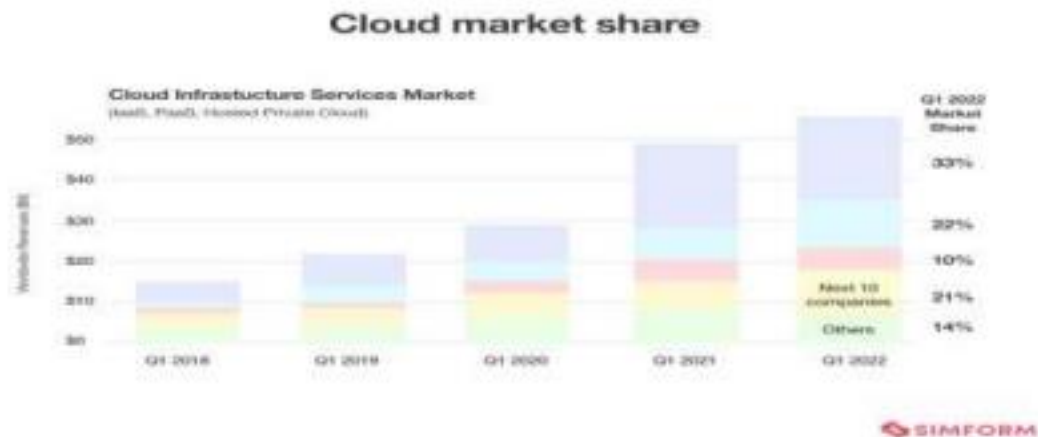

FIGURE 2. Global cloud Infrastructure Services

AMAZON WEB SERVICE (AWS):

Amazon web Services is one of the oldest players in the market it was started in 2006. It provides a range of computing

services like cloud storage, database service, analytics, network Internet of things, mobile computing and enterprise services. As these services provide an organization to grow at faster rate reduce their cost and scale up their business. As AWS is one of the oldest cloud platforms in the market and its one of the famous cloud platforms available. So, AWS is widely available. Amazon web Services (AWS) has 105 availability zones worldwide.

Top companies using Amazon Web Service:

Netflix	Expedia
Spotify	Pinterest
Airbnb	Samsung
Uber	Sony
Peloton	Novartis

FIGURE 3. Amazon Web Services Growth Since 2004

GOOGLE CLOUD PLATFORM (GCP):

Google cloud platform (GCP) launched in in 2011 by Google to provide cloud computing services to its customers. Services provided by GCP includes storage, big data, databases, analytics, cloud AI, Network, mobile computing, development tools, management tools, Internet of things, cloud security and data transfer. Google cloud platform (GCP) has 21 availability zones worldwide.

Top companies using Google Cloud Platform:

Verizon	SAP
Twitch	Facebook
CenturyLink	Intel

LinkedIn	Yahoo
NewsCorp	Marriott

FIGURE 4. Google cloud platform (GCP) since 2011

MICROSOSFT AZURE:

Microsoft Azure was launched in 2010 as Windows Azure, and later in 2014, it was renamed, Microsoft Azure. It was launched years after the release of AWS and Google cloud but still, it is the fastest-growing cloud and giving tough competition to AWS and other cloud service providers. There is a five-year partnership between Microsoft and Disney. In this partnership, the new method will be developed to move production content to the cloud. Azure has 60 data centers regions across the world available in 140 countries.

Top companies using Microsoft Azure:

Walmart	Bank of America
Macy' S	JP Morgan Chase
The Home Depot	Citigroup
Starbucks	Fidelity Investments
Coca-Cola	Standard Chartered

FIGURE 5: cloud computing service model

CLOUD COMPUTING SERVICES:

The essential services provide Software as a Service (SaaS), Platform as a Service (PaaS), Infrastructure as a Service (IaaS). There can be many other services such as Hardware as a Service (HaaS), Communication as a Service (CaaS), Database as a Service (DaaS) and XaaS (anything as a service).

SOFTWARE AS A SERVICE (SAAS):

Software as a Services (SaaS)is a way of delivering services and applications over the Internet. SaaS is an application or system in which mounted over internet cloud and it provides some services for a specific client. SaaS provides a complete software solution that you purchase on a pay-as-you-go basis from a cloud service provider. Most SaaS applications can be run directly from a web browser without any downloads or installations required. The SaaS applications are sometimes called Web-based software, on-demand software, or hosted software**.**

FIGURE 6: Software as a Services

PLATFORM AS A SERVICE (PAAS):

Platform as a Services (PaaS) can be used to develop application without the complexity of managing the underlying hardware and software. PaaS is a category of cloud computing that provides a platform and environment to allow developers to build applications and services over the internet. PaaS provider hosts the hardware and software on its own infrastructure.

FIGURE 7: Platform as a Services

INFRASTRUCTURE AS A SERVICE (IAAS):

Infrastructure as a Services (IaaS) it contains servers, connections and switches that create a logical infrastructure through virtualization for different working sessions. Infrastructure as a service (IaaS) is a service model that delivers computer infrastructure on an outsourced basis to support various operations. Typically, IaaS is a service where infrastructure is provided as outsourcing to enterprises such as networking equipment, devices, database, and web servers. IaaS is also known as Hardware as a Service **(HaaS).**

FIGURE 8: Infrastructure as a Services (IaaS)

APPLICATION OF CLOUD COMPUTING:

Cloud technology offers several applications in various fields like business, data storage, entertainment management, social networking, education, art, GPS, etc.

A). Online Data Storage: Cloud Computing allows storage and access to data like files, images, audio, and videos on the cloud storage. In this age of big data, storing huge volumes of business data locally requires more and more space and escalating costs. This is where cloud storage comes into play, where businesses can store and access data using multiple devices.

B). Backup and Recovery: Cloud service providers offer safe storage and backup facility for data and resources on the cloud. In a traditional computing system, data backup is a complex problem, and often, in case of a disaster, data can be permanently lost. But with cloud computing, data can be easily recovered with minimal damage in case of a disaster.

C). Big Data Analysis: One of the most important applications of cloud computing is its role in extensive data analysis. The extremely large volume of big data makes it impossible to store using traditional data management systems. Due to the unlimited storage capacity of the cloud, businesses can now store and analyze big data to gain valuable business insights.

D). Testing and Development: Cloud computing applications provide the easiest approach for testing and development of products. In traditional methods, such an environment would be time consuming, expensive due to the setting up of IT resources and infrastructure, and needed manpower. However, with cloud computing, businesses get scalable and flexible cloud services, which they can use for product development, testing, and deployment.

E). Antivirus Application: The Cloud Computing comes cloud antivirus software which is stored in the cloud from where they monitor viruses and malware in the organization's system and fixes them. Earlier, organizations had to install antivirus software within their system and detect security threats.

F). E-Commerce Application: Ecommerce applications in the cloud enable users and e-businesses to respond quickly to emerging opportunities. It offers a new approach to business leaders to make things done with minimum amount and minimal time. They use cloud environments to manage customer data, product data, and other operational systems.

G). Cloud Computing in Education: E-learning, online distance learning programs, and student information portals are some of the key changes brought about by applications of cloud computing in the education sector. In this new learning environment, there's an attractive environment for learning, teaching, experimenting provided to students, teachers, and researchers so they can connect to the cloud of their establishment and access data and information.

H). Social Network Platforms: Social network platforms play an important role in day-to-day life. They have changed the way of communication and interaction. These platforms have a large number of users across the globe and this makes

them ideal candidates for cloud computing adaptation. Social media sites contain heavy multimedia content like images and videos and they are capable of making the whole network slow, here cloud storage comes into play. Cloud storage helps social media applications run smoothly.

I). Cloud computing in Medical Fields: The medical field also, cloud computing is doing wonders. It is used to store data of patients and helps to access it over the internet without any need of the physical computer set up to trace the previous records, or even doesn't need the paperwork. In case of emergencies, the patient's data can be accessed remotely from anywhere rather than waiting till they get access to information from the hospital computer.

CHALLENGES IN CLOUD COMPUTING:

A). Data Security and Privacy: Data security is a major concern when switching to cloud computing. User or organizational data stored in the cloud is critical and private. Even if the cloud service provider assures data integrity, it is your responsibility to carry out user authentication and authorization, identity management, data encryption, and access control. Security issues on the cloud include identity theft, data breaches, malware infections, and a lot more which eventually decrease the trust amongst the users of your applications.

B). Cost Management: all cloud service providers have a Pay as You Go model, which reduces the overall cost of the resources being used, there are times when there are huge costs incurred to the enterprise using cloud computing. When there is under optimization of the resources.

C). Multi-Cloud Environments: An increase in the options available to the companies, enterprises not only use a single cloud but depend on multiple cloud service providers. Most of these companies use hybrid cloud tactics and close to 84% are dependent on multiple clouds. This often ends up being hindered and difficult to manage for the infrastructure team. The process most of the time ends up being highly complex for the IT team due to the differences between multiple cloud providers.

D). Performance Challenges: Performance is an important factor while considering cloud-based solutions. If the performance of the cloud is not satisfactory, it can drive away users and decrease profits. Even a little latency while loading an app or a web page can result in a huge drop in the percentage of users. This latency can be a product of inefficient load balancing, which means that the server cannot efficiently split the incoming traffic so as to provide the best user experience.

E). High Dependence on Network: cloud computing deals with provisioning resources in real-time, it deals with enormous amounts of data transfer to and from the servers. This is only made possible due to the availability of the high-speed network. Although these data and resources are exchanged over the network, this can prove to be highly vulnerable in case of limited bandwidth or cases when there is a sudden outage.

F). Lack of Knowledge Expertise: the complex nature and the high demand for research working with the cloud often ends up being a highly tedious task. It requires immense knowledge and wide expertise on the subject. Although there are a lot of professionals in the field they need to constantly update themselves. Cloud computing is a highly paid job due to the extensive gap between demand and supply. There are a lot of vacancies but very few talented cloud engineers, developers, and professionals.

CONCLUSION:

Cloud computing can be defined as the delivery of various on-demand computing services like – servers, software, storage, databases, networking, analytics, and intelligence over the internet. Cloud providers literally provide everything as a service. Organizations have a lot of data and on expansion, there are a lot of things to be taken care of, like data centers, increasing demand for computing and networking devices, and the need for more storage capacity. Also, here the demand plays a major role, sometimes it can increase at an unexpected rate, and sometimes it can decrease abruptly. There are n number of service provider in the market and This paper comprises the cost of top three cloud platform service providers along with basic pricing schemes of Amazon web services, Microsoft Azure and Google cloud platform. These platforms allow customers to focus on business rather than technical aspects. The thing is that all three platform have in common are on demand services, flexibility, support and security

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