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An Analytical Study on: Life with Cloud in COVID-19 Era

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Abstract: ***In this current scenario everybody may not well acquainted with cloud though they use it in their daily life.Cloud technology provides the services of technological resources on demand through Internet. During COVID-19, cloud technology became a lifeline for different sectors to provide necessary services. The COVID-19 pandemic has compelled us to restructure the life style including work style, education, organizing event, socializing etc. Cloud computing has a major role to handle crisis and maintain continuity in providing services.In this paper we have focused the booming of cloud technology in the outbreak of COVID 19. We have also emphasized on the use of hybrid cloud in various sector.***

Keywords: Cloud Technology, COVID-19, Hybrid cloud

1. Introduction

Cloud computing is a fast growing "Internet Based Computing" which offers the users to host their data on the web by means of cloud services. Cloud computing is a delivery model which allows users to connect with the server and can avail resources like hardware, software, memory etc. Cloud computing delivers reliable and user-friendly services like Infrastructure as a service (IAAS), Platform as a service (PAAS) and Software as a service (SAAS) as a subscription-based services [1].According to National Institute of Standards and Technology (NIST) – "the major objective of cloud computing is to maximize the shared resources and at the same time the disadvantage is its high infrastructure cost and unnecessary power consumption."

Cloud deployments can be classified mainly into three categories: Public Cloud, Private Cloud and Hybrid Cloud.

Public Clouds: Public Cloud is the most common type of deployment model in which services are provided to anybody on Internet. Public cloud providers are quite large enough basically contains thousands of servers with high speed network and the providers support thousands of public domain users on 24 x 7 basis. Some of the popular public Clouds are Amazon Web Services (AWS), Microsoft Azure etc.

Private Clouds- Private Clouds restrict all the flexibility of public cloud. These are deployed within an organization to deliver IT services to its own users only. As per the security concern private Cloud services are fully secured in comparison to public cloud.

Hybrid cloud: Hybrid cloud may be defined as a cloud set-up consist of two or more cloud infrastructures like private, public, and community clouds. The different segment of clouds bound together through technologies and approaches to fulfil the purposes of providing application services. In this model, organizations outsource non-critical information and processing to the public Cloud, while keeping critical services and data in their control [6]. Hybrid cloud is empowered with the advantages of both public and private cloud. Therefore, organizations can utilize their existing IT infrastructure for maintaining sensitive information within the premises, and whenever require auto-scaling their resources using public Clouds [6]. Generally, the hybrid Cloud is applied in services related IT infrastructure.

2. COVID 19 Impact

The Covid19 pandemic has totally changed life as we know it. The year 2020 is likely to be remembered as the year when remote work became a reality for millions of people globally [2]. A direct result of this contagion is that businesses and their employees worldwide are facing tremendous challenges in maintaining business continuity [2]. In these difficult times, cloud computing has emerged as a exact saviour in confirming business continuity and is also experiencing sustainability.

Just prior to COVID-19 we all were closely attached with technology like Internet, smartphones, Google, e-conference etc. But life has changed drastically in COVID and allthese technologies are taken place of new normal. This pandemic has added a wider and border aspect to all these technologies. They are now basic necessities for maintaining personal, professional, and economic survival in this u turned world.

3. Discussion

While many companies are finding it difficult to adopt the new normal, enterprises hat had opted to invest in a robust cloud computing infrastructure ahead of this pandemic are functioning well[3]. Cloud computing facilitate safe communication among employees and also in between

employees and customer in current social distanced globe. Nearly one or two decade ago, cloud was considered an insignificant expenditure, but because of COVID-19 pandemic, there was a drastic change in the work environment. Number of enterprises picked the option to reduce the office size and migrated to cloud. This caused in growing the business for cloud service providers. Customers from different levels adopted cloud services for their requirement. For example, organizations are utilising cloud automation to increase their online presence by developing commerce websites on cloud platforms. SaaS segment that relies on service desks, accounting packages, customer relationship management, human resource management and enterprise resource planning gained growth potential even during the COVID times. Healthcare system needed scalable and secured cloud infrastructure to manage and maintain patient information with high speed and flexibility which certainly helped during the pandemic [11].

Cloud Technology is helping the business world in number of ways. There are number of ways that cloud computing is helping manage businesses during Covid19 times. These are:

Remote workforce: -
Since March 2020, governments worldwide started enforcing lockdown orders on the population of entire cities, counties, and countries. As a result, there has been a surge in the use of video conferencing tools and virtual meeting software within a short period. In June 2020, Zoom reported a year-on-year increase of 169% in its total revenue due to the accelerated adoption of its platform globally [3].

Machine learning in HealthCare
Cloud services paired with AI helped healthcare providers continue safely serving patients at a time of overwhelming demand, crowded hospitals, and exhausted frontline workers [5].

Cloud in Education
As schools all over the world closed their doors due to COVID-19, policy makers, parents, teachers, and administrators turned to technology to help students continue their education, experimenting with new online learning models to keep students engaged [5].

Easy online data backup
In the business world data is considered as the primary asset and so also effective and safe data storage. In such a situation, cloud computing can support us by providing online data backup solutions which is easily accessible and less expensive. Online data backup services like Dropbox, Google Drive are generally preferred and popularly adopted solution.

While such services are convenient to use, there are inherent security risks using such third-party file sharing solutions. Data is usually taken outside an organization's IT environment, which implies that it goes beyond its control [3]. A solution to such a security problem is provided by Centrestack, which provides a cloud file server that enhances file server mobility and simplifies remote access to data [3]."From our collaboration with Ministry of Education (MoE) and Niti Aayog on sam Shiksha; from Watson Decision Platform for Agriculture supporting farmers in Karnataka; to STEM programs across 10 states in India and AI curriculum in 160 CBSE schools accessed by over 12,000 students, IBM has been at the forefront of driving innovation and impact," Sandip Patel, Managing Director, IBM India/South Asia, said[8].The post-Covid world offers an opportunity for those enterprises who have not yet opt hybrid cloud architecture. A shift to the hybrid cloud provides security for their mission-critical workloads, elasticity for delivery, and high performance to match the ever-growing need for constant innovation [7].

Anytime society adopts any new things speedily, there may be some high-risk factors. So, we must consider some factors carefully like what type of cloud we are using, what sort of data we are storing, how much secure the services etc.

4. Developing Hybrid Cloud

Professionals should go for open-source software like Linux in order to facilitate innovation and overcome drawbacksFor virtualisation and orchestration to package their applications with their software dependencies and to accelerate development and deployment; they can look at technologies such as containers and Kubernetes [7].

Hybrid cloud developers should priorities mainly two important factors, those are: - Open-source and security. During the building of hybrid clouds factors like cost optimisation mechanisms, ensure security, managing complexity etc should be taken care of.

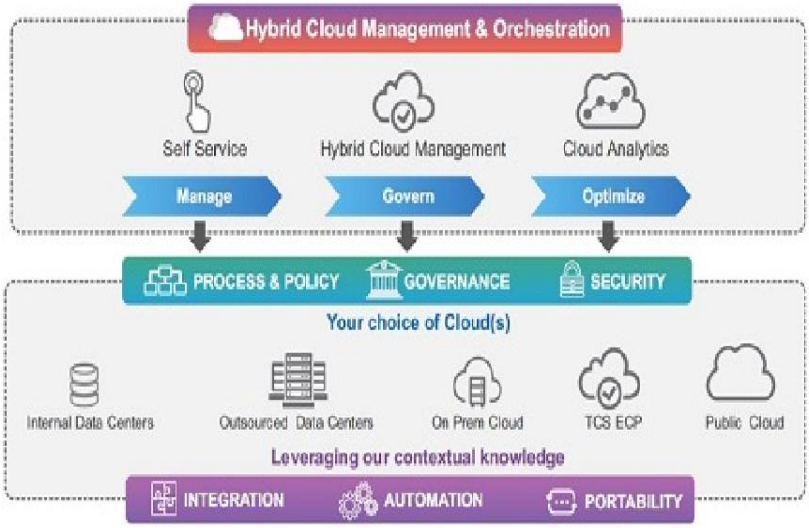


Diagram 1: Hybrid Cloud [9]

For a successful deployment of hybrid cloud trained team with proper planning is the most essential factor. Sometimes due to the lack of experience and expertise, the team may face some common challenges, those are-

1) ***Managing* costs** is a significant challenge as different skills are required for using public cloud and private resources. As public cloud permits us to consume resources easily, the team may use more than what they actually need. Public cloud also forces users to predict capacity, sizing virtual machines in advance. It's not uncommon to oversize capacity, which adds unneeded expenses. Managing cost is an important element in successfully using public cloud resources 12].
2) ***Security*** is also a major challenge with public cloud because it is dissimilar than traditional on-premises model. In the public cloud, APIs are mainly look after the security. It means developers set it up instead of the IT operations team. Sometimes the lack of experience of designersmay cause some problems if not taken care in advance.
3) ***Compliance*** in following regulations that govern the use of sensitive business data is another cloud challenge to the enterprise, again due to inexperience. In this scenario (like security issues), developers are not experienced in this new compliance role because it was typically handled by the IT ops team. Because the IT organization is fully responsible for all compliance-related issues, this is an area where additional training and tooling are probably needed. The cost of not being compliant could be catastrophic in terms of fees, lawsuits, and business reputation [12].
4) Historically**, *governance* for** IT in an enterprise was based on gates, designed to provide oversight and direction. The goal of governance is to foster standardization and improve quality, yet it also tends to slow down the development process. Using public cloud, the governance process is completely different. And it tends to be faster – which can be a good thing, as it lets developers move as quickly as they want. But without expertise in this area, it can also cause problems [12].

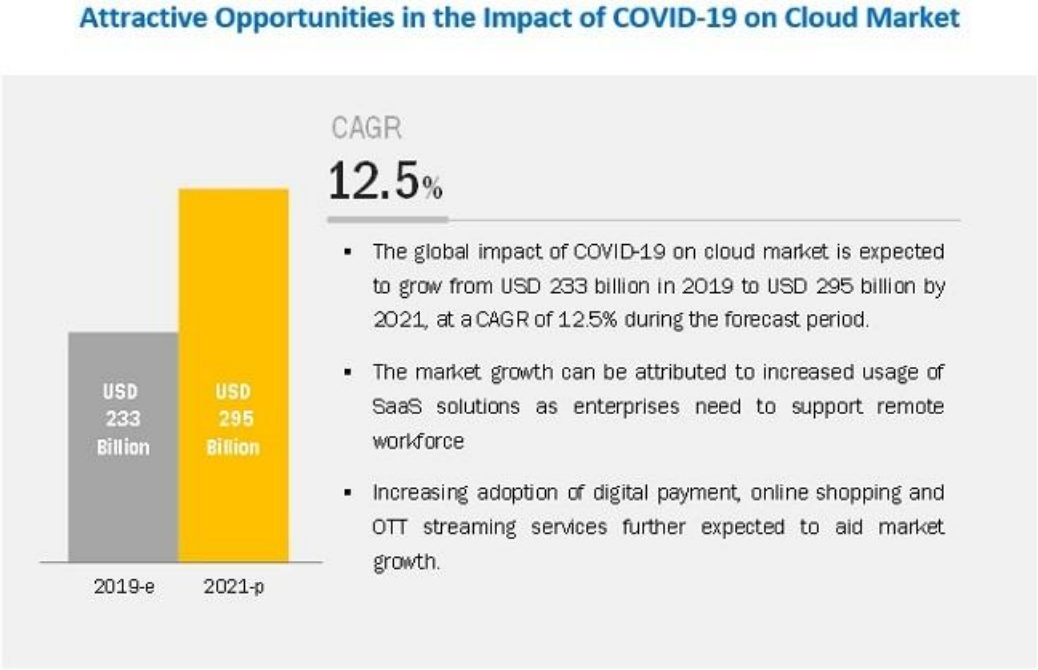
5. Hybrid Cloud Benefits

A hybrid cloud environment gives enterprises the choice of how and where data is stored within their organisation and enables the protection of data wherever it resides [7]. It allows enterprises to quickly deploy applications to fulfil customer necessities and enhance business opportunities. A hybrid cloud environment allows the development of new cloud-native applications using containers, so they can be hosted on the private and public cloud [7]. Deploying hybrid cloud applications using Kubernetes helps to handle cloud complexity and also minimising cost.

It simplifies effective distribution of workloads and allocation of resources and accordingly it minimises the costs of data centre, software, licensing etc.

A modern hybrid cloud perfectly aligns with the future of work in the post-Covid world as it empowers employees, spurs innovation, and enables transformational projects during a time when change is constant [7]. A hybrid cloud policy help in cost saving, easy data management, and faster time to market.

A research found that the hybrid cloud market will grow to $97.6 billion by 2023, at a CAGR of 17 percent as hybrid not only helps in easing the economic factors for an organization but also delivers security. Even human cloud is also an emerging trend in the B2B sector anticipating 22% year over year growth. Although opting for the hybrid cloud strategy can pose a challenge for large enterprises due to complex IT architecture and security challenges, hybrid cloud is poised to serve as a revolution for organizations due to the inherent flexibility, agility and efficiencies they offer. In simple terms, hybrid cloud is the future of IT in the post COVID-19 world [11]



6. Conclusion

As maximum sectors have adopted “work from home” so there is a rapid growth of online data. Also “working from home “is mainly based on cloud computing application. In this way on one side cloud is providing the base to maintain the continuity of business and on other side cloud is also supporting online data storage. The increased use of hybrid cloud services has placed cloud adoption as 'new normal /' now more than ever." As per the study and analysis it can be concluded that in the COVID-19 pandemic crisis the cloud computing has played the role of lead hero. One of the major advantages of cloud is that it guarantees business continuity even in unpredicted situations. Migrating services and software to the cloud is one effective step towards the digital transformation. However, cloud providers must take preventive to maintain customer’s data privacy. Cloud computing has, become the prime technology beneficiary of the COVID-19, There is no doubt that hybrid Cloud implementation with agile and sustainability will lead cloud to the ever-growing phase. The pandemic has forced the globe to understand the necessity of digital transformation for organizations. An effective and sustainable hybrid cloud platform can empower companies to face the unpredictable challenges during times of uncertainty, also it will help in their digital journey.

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