

The Green Future Of Cloud Computing In Response To Covid-19 Pandemic

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Abstract

Cloud computing is always decidedly scalable and commercial infrastructure for venture and many web based applications which also bring in innovative challenges for in various aspects of environmental safety. On the other hand, the rising demand of Cloud infrastructure has considerably enlarged the energy utilization of data centers, which has become a vital subject today. Cloud computing technology has a collection of various application domains as a part, as they propose scalability, even they are reliable and also it offers high performance at relatively low price. Eminent energy consumption not only translates to high operational cost, which minimizes the profit margin of Cloud providers, but also leads to high carbon emissions which is not environmental friendly at all. The cloud computing rebellion is redesigning current networking, and offering promising environmental protection prospects as well as financially viable and technical compensation. These technologies have the prospective to develop energy efficiency and to diminish carbon footprints and (e-) waste. Thus, energy-efficient mechanisms are required to minimize the impact of Cloud computing on the environment. These methodologies can surely transform cloud computing into green cloud computing.

Keywords: *Cloud Computing, Covid 19 pandemic, Data sets, Data centers, Green Computing*

INTRODUCTION

Cloud computing is also known as delivery of diverse services by using the Internet. Such resources also include tools and applications like data storage, databases, networking, software and servers.

Instead of keeping files and data on a hard disk or else any local storage device, cloud-based data storage makes it possible to save them to a remote database. On this condition that an electronic device has access to the web or internet, it has access to the data and the software programs to running in it. There are many benefits so cloud computing is a accepted preference for communities and businesses for a number of reasons which includes cost savings, increased productivity, privacy and security, performances well as speed and efficiency. Business and companies which provide cloud services permit users to stock up files and applications on remote servers and then access all their data via the web applications . This also means the user is not required to be in a particular place to achieve access to it, allowing the user to work remotely. This cloud computing technology carries all the important stimulating involved in crunching and handing out data away from the device you carry with you or sit down and work around. It also moves all of your data and information to massive computer storage space clusters distant away in the world of cyberspace. The Internet becomes the cloud, your files or data, work, and web applications are accessible from any device with which you can connect to the Internet, anywhere in the world.

Cloud Deployment Models

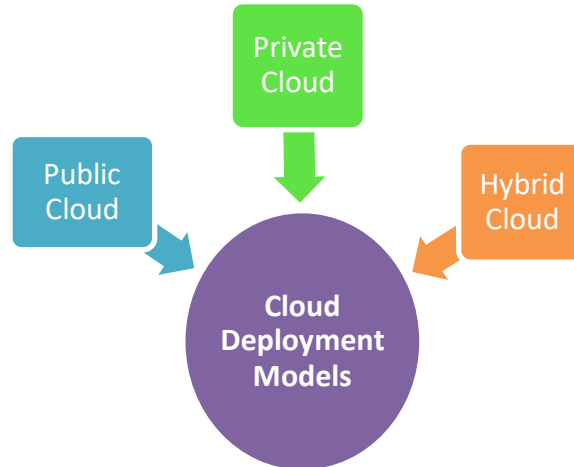


Figure (a): Cloud Deployment Models

These cloud computing models can be both public and private. Refer Figure (a) Public cloud services provide their services over the Internet. Private cloud services, on the other hand, only provide services to a certain number of people. These services are a system of networks that supply appended services. There is also a hybrid option, which combines essentials of both the public and private cloud services. Despite the consequences as said the kind of service, cloud computing services provide users with a string of functions which includes Emails, Storage, backup, and data retrieval, Creating and testing apps, Analyzing data, Audio and video streaming functions, Delivery of software on demand. Cloud computing is still a comparatively new service but is being used by a good amount of different organizations from big corporations to small businesses, nonprofits to government organizations, and even personage consumers. There exist many types of clouds, each of which is dissimilar from another. Public clouds make available their services on servers and storage on the Internet. These are operated by third-party organizations, which handle and control all the hardware, software, and the general infrastructure. Clients access services through various accounts that can be accessed or managed through web applications. Private clouds are held in reserve for explicit consumers, usually one or more business or organization. These organization's data centers can host the cloud computing service. Various private cloud computing services are resided on a private network. Usually hybrid clouds are therefore, as the forename says a combination of both public and private cloud services. This type of model allows the user more flexibility and helps to optimize the user's communications and security.

Cloud Service Models



Figure (b): Cloud Service Models

Cloud computing is primarily comprised as of mainly three services: *Refer Figure (b)*

- Software-as-a-service (SaaS),
- Infrastructure-as-a-service (IaaS),
- Platform-as-a-service (PaaS).

Software-as-a-service (SaaS) includes and provides the license of a software application to customers. Licenses are characteristically provided throughout a pay-as-you-go model or on-demand. Such similar type of system is also found in Microsoft Office's 365. Software as a service uses web or internet to deliver applications which managed by a third party vendor and whose interface is accessed on client side. SAAS directly runs from web browser without any downloads & installations required. In SAAS, everything is managed by vendors.[1]

Infrastructure-as-a-service (IaaS) involves a method for delivering all services from operating systems to data servers and data storage via IP based connection as component of an on-demand service. Cloud using consumers can evade the requirement to pay for software or servers, and instead acquire these resources in an outsourced, on-demand self service. Accepted examples of the IaaS systems incorporate IBM Cloud and Microsoft Azure. Infrastructure as a service is mostly referred to compute resources such as processors, memory, storage, bandwidth, etc. are provided an as needed, pay as you go model in cloud computing.[1]

Platform-as-a-service (PaaS) is well thought-out the majority complex of the three layers of cloud-based computing. PaaS shares some commonalities with SaaS, the primary difference being that instead of delivering software online, it is actually a platform for creating software that is delivered via the Internet. This model includes platforms like Salesforce.com, etc. Usually computational resources are delivered through a platform in PAAS. PAAS provides a whole computational infrastructure, the hardware & the platforms that are installed on top of the hardware. PAAS is exceedingly scalable and consumers don't need to worry about platform up gradations. [1]

Businesses and organizations can make use of cloud computing in dissimilar ways. Some consumers maintain all apps and data on the cloud, while others use a hybrid model, keeping certain applications and information on private servers and others on the cloud.

When the consumer demands for services, the giant troupes in the corporate computing field includes Google Cloud, [Amazon Web Services](#) (AWS), Microsoft Azure, IBM Cloud, Alibaba Cloud, etc. An elementary conception behind cloud computing is always the location of the service, and many times of the facts such as the hardware or operating system on which it is operating, are mostly immaterial to the user.

Green effects of Covid 19 pandemic on cloud data and its services

As the spread of Covid 19 all over the world and because of the abundant advantages and benefits, more and more consumers say they have a preference of online shopping over conformist shopping these days. The customer's decision-making method has distorted dramatically from last couple of years. Customers are conducting wide-ranging exploration online before ever talking to any sales person. Customers are also making more direct purchases online and by the use of their smartphones, never stepping foot into traditional conventional locations. The use of internet helps doing business much easier and faster. It's led to changes in the way people do business with a swiftly increasing worldwide tendency towards online shopping or e-commerce.

During this COVID 19 Pandemic, business (from many sectors like Consumer product, Hospitality, Industrial, Transportation etc.) have taken approach of Cloud seriously. Before the Pandemic, these means (particularly Cloud) was known to masses, but they were reluctant to use. With Covid Pandemic, people are working from remote location; customers are not willing to see the product; patients are not able to visit the doctors and with these situations, handling of data is more important than ever. With more data, more secured place is required for storage. This storage has to be safe, perpetual and easy to

use and access. This is where cloud computing come to lend a hand to all business and organizations to run it effectively.

Businesses have taken new swift. Like many software especially in the field of architectural, engineering, education related and all other sector today are working with cloud environment. Here, local users or customers do not require high end hardware setups. Small storage and processing is enough for it, however main storage and processing is over cloud. Many a times, multiple users can work on same file or database without distorting its original value. Here, main file or database remains on cloud and overall functionality remains with administrator. This way projects can run faster and project owners are saved from data distortion or loss.

Conclusion

Today users also access free product reviews and are capable to make well-versed decisions before building a decision. Also due to lockdown effect, man power is operating from remote locations; engineering and industrial software's can be operated from any remote location with the help of cloud computing services. In this Covid 19 pandemic situation these cloud computing services are acting as business saviors. Many businesses today are using these cloud services for unstoppable work continuation. Cloud computing has removed all the hindrances

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