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A Review Paper on Benefits of Virtualization Technology

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ABSTRACT- Cloud computing is one of the most significant milestones in the development of next-generation technology and the growing commercial and IT fields. It aids in the resolution of issues such as data loss, data accessibility, and data security. This technology is mostly service-oriented, with an emphasis on cost reduction, hardware reduction, and a pay-as-you-go model. In cloud computing, virtualization refers to the creation of a virtual image of storage devices, servers, or network resources that may be utilized on many computers at the same time. Cloud computing is a very helpful technology that is extensively utilized across the globe. It mostly offers IT services and solutions that are available on demand. Virtualization is important in cloud computing because it allows cloud customers to access virtual storage and compute resources, which is only feasible with virtualization. Cloud computing is a new computer paradigm for businesses that is built on virtualisation, multi-tenancy, and shared infrastructures.

KEYWORDS- Architecture, Cloud Computing, Hardware, Technology, Virtualization.

I. INTRODUCTION

Cloud computing is a very helpful technology that is extensively utilized across the globe. It mostly offers IT services and solutions that are available on demand. Virtualization is important in cloud computing because it allows cloud customers to access virtual storage and compute resources, which is only feasible with virtualization. Cloud computing [1] is a new computing paradigm based on virtual machines, multi-tenancy, and allowed to share infrastructure for enterprises. This article discusses cloud-based-applications [2], how thin provisioning is used in cloud technology, virtualization's basic architectural style, and its advantages and drawbacks.[3]–[7].

A. Cloud Computing

"Cloud computing technology [8] is centered on three pillars: grid computer, utility computing, and automation computing." All of the data is stored on storage and can be retrieved from somewhere else on the planet without entering in over the internet. Subscribers of the top cloud vendors, also including Microsoft, Amazon, and Apple, have availability to absolutely massive amount of storage, making job simpler. [9].

B. Virtualization

The technique of producing a digital representation or "version" of something like a server, system-software [10], memory sticks, or networking equipment that may be used upon many nodes at the same time is known as VMware. The basic purpose of virtualization seems to be to manage operations by altering traditional computer to make it so much more scalable, productive, and premium [11]. Automation includes operating platform virtualized, hardware cloud computing, and cloud servers. Virtualization is a charge and resource hardware reduction innovation that is constantly shifting the basic computing methodology.

C. Virtualized Technology Architecture

Space or memory is practically assigned to workers in cloud computing waitrons [11], which necessitates the usage of a crowd on which a hyper-visor (software that interfaces with technology) [12] operates. Below Figure 1 shows the basic architecture.

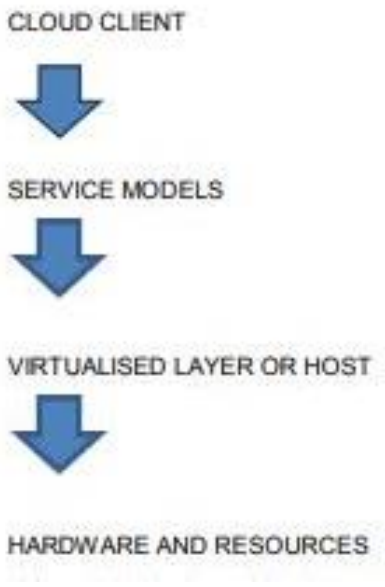

Figure 1: The above figure shows the Basic Architecture

The virtualization model is made up of cloud services, service level agreements, virtualized product lines, and associated host software, along with their hardware [13]. "Virtualization software will allow you to run multiple similar functionality and numerous applications on the same set of servers," says Mike Adams, director of marketing management at VMware, a forerunner in virtual servers and cloud applications and services . SAAS (software as a service), PAAS (platform as a service), and IAAS (infrastructure as a service) are the

multiple service architectures on which it is predicated (infrastructure as a service) [14]. SAAS offers cloud-customers with apps to see their requirements and expectations[15]. PAAS-offers cloud customers with a standard platform for their applications to run on, whereas IAAS Security and hardware are provided to keep resources in the cloud operational. The basic idea is to pool massive amount of natural resources such as computational cycles (VCPUs), storage, and software solutions [16], and so on.

1) Host-Module

The hypervisor-software for virtualization-operates on a virtualization-platform, which is called a host [17].

2) Hypervisor-module

A hypervisor is a software application that controls virtualization and allows them to run in a virtual environment [12].

D. Traditional and Virtual Servers

In the cloud computing technology, it serves as a critical infrastructure. It accepts requests from cloud users, formulates them, and executes a variety of activities [18]. Traditional servers in their most basic form conventionally, the servers that were utilized had a slew of drawbacks and were not costeffective in the least. “System administrators manage these servers, which are often characterized as a combined entity that includes the operating system, the architecture, the storage, and indeed the software". If the storage on a conventional server fills up, it must be replaced with a new server[19], [20]. Figure 2 shows the virtual server concept.

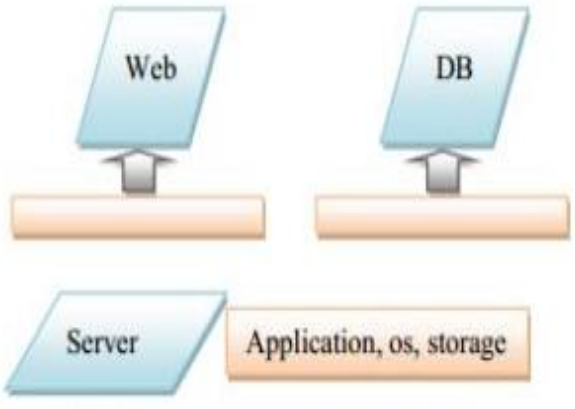

Figure 2: The above figure shows the Virtual server concept

1) Advantage

- It is simple to deploy things in them.
- It's simple to keep track of downloads..
- To execute the program virtually, traditional infrastructure might be employed.

2) Disadvantages

- Hardware servicing is quite expensive.
- Data redundancy is quite expensive.
- Rebuilding the necessary infrastructure is impractical.
- Creating redundancy is a tricky problem.

E. Virtual Server

The operating system (OS), storage, and application make up a virtual-server, which efforts to isolate keeping the server software independent from the infrastructure is a smart option [21]. We may decrease the service offered by the cloud earner by keeping virtual-servers. Figure 3 shows the Virtual Server Concept[22].

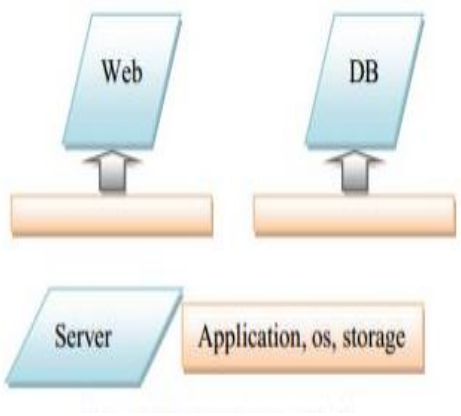

Figure 3: The above figure shows the Virtual Server Concept

3) Merits

- Upkeep of the IT pool.
- High hardware availability.
- Server deployment in a virtualized environment

F. Advancement of Real World

Network virtualization has a wide range of positive and negative environmental consequences, as well as on enterprise and IT [23].

1) Temperature

Virtualization technology is built on a collection of physical devices that generate a lot of heat when they are utilized. To address this issue, a specific cooling system should be used to cool them and improve their performance.

2) Consumption of Energy

By decreasing the quantity of physical devices, virtualized decreases computers power consumption, enabling this approach more economic and environmental sustainable.

3) Redundancy

Redundancy is the repeating of data that occurs when two or more technologies do not seem to have the same interface store location and several memory storages are formed. Because of the huge number of data centers, failure tolerance is extremely high, reducing redundancy [2].

G. Virtualization types

Virtualization in cloudcomputing may be accomplished Virtualization may be accomplished through two: storage virtualization and software translation. Figure 4 shows a virtual upgradeable model.

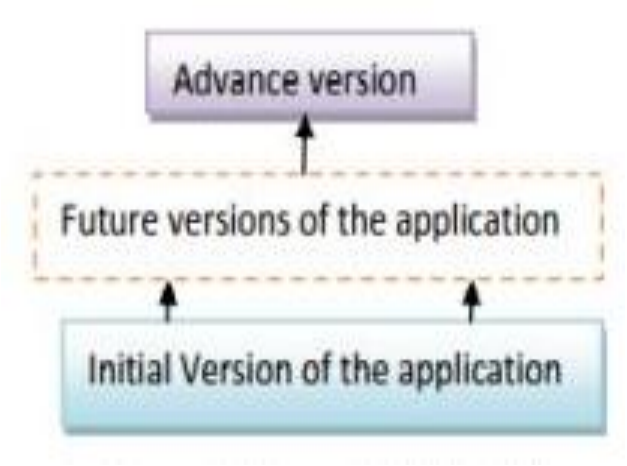

Figure 4: The above figure shows the Upgradable Model

1) Storage-virtualization

The accessible stowage is virtualized in order to provide massive virtual-storage entrée and is utilized to allocate memory to cloud clients.

2) Software virtualization

With the assistance of virtualization, a huge number of computers may utilize the company's software at the same time. On which the program is installed and utilized, a virtual layer is formed.

H. Purpose of Virtualization?

We may improve the utilization of resources available to us in various ways with the assistance of virtualization. Because of the following reasons, we should virtualize:

1) User Isolation

One customer should be separated from other consumers so that he or herself does not gain knowledge about or connection to these other users' data and behaviour.

2) Resource sharing

Using virtualization techniques, a large supply can be scrappy into several virtual possessions and used by multiple users.

3) Dynamical resources

Reallocating resources like stowing and computing-resources is challenging, but they can be readily when they are virtualized, they will indeed be re-allocated.

4) Resource aggregation

The minimal available resources can be enhanced significantly through the use of virtualization.

II. DISCUSSION

The author has discussed about the benefits of virtualization technology, Cloud computing is a watershed moment in the evolution of next-generation technology as well as the expanding commercial and IT sectors. It might help with difficulties like data loss, data availability, and data security. This technology has mostly been targeted toward companies, with an emphasis on cost minimization, hardware minimization, and a pay-as-you-go strategy. In cloud computing, virtualization refers to the creation of a virtual image of hard drives, servers, or networking devices that may be utilized on many computers at the same time. VirtualBox is a very breakthrough property that is utilized all over the world. It dedicated to providing IT products and solutions that are driven by demand. Virtualization is significant in cloud applications because that allows cloud consumers to connect virtualized massive processing capabilities, which is only accessible through virtualization.

III. CONCLUSION

The author has concluded about the benefits of virtualization technology, Virtualization is significant in cloud computing because that allows cloud consumers to connect simulated data processing resources, which could only be done through virtualisation. Cloudcomputing is a new computational paradigm for organizations that is built on virtualized, multitenancy, including shared technology. VirtualBox is important in public cloud because it allows cloud users to access abstracted large computer resources, which is only accessible through virtualization. Technology is a modern cloud computing model for organizations that is built on virtualized environments, multi-tenancy, and sharing architectures. Virtualization is the process of creating an artificial image or "version" of a server, operating system, memory sticks, or infrastructure elements that may be utilized on several computers at the same time. Virtualization's major goal is to manage workloads by making traditional computers more adaptive, efficient, and cost-effective.

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