Analysis of the Multitasking Feature-Virtualization and Virtual Storage in Cloud

Ashima Narang

Assistant Professor, Department of Computer Science, Amity University, India

ABSTRACT: Cloud computing is the topic where the research is going on these days, but along with this virtualization is the technology which works hand in hand. Here, in this paper, we will discuss about what virtualization is, what its role in Cloud computing is, how the hypervisor works, virtualization storage and various benefits of virtualization.

KEYWORDS: cloud computing, virtualization, storage virtualization, hypervisor

I. INTRODUCTION

Cloud Computing allows the system to access the huge amount of information, data and the user uses the service and pays according to the use. In recent years, cloud computing has emerged collectively as the fastest growing segments of the IT trade and additional businesses have shifted to the cloud. It changes the delivery model which provides on demand self service access to a shared pool of the physical and virtual computing resources via a broad network access. Providing secure virtualization may be a major element of this model. Cloud computing already leverages virtualization for load levelling via dynamic provisioning and migration of virtual machines physical resources. However, virtualization technologies conjointly produce new potential considerations with reference to security. [1] Cloud computing also leverages virtualization for load balancing of the nodes via dynamic provisioning and migration of the virtual machines among physical resources.[2] However, virtualization techniques and technologies also get the new potential concerns to security issues.[3]

Virtualization is the abstraction of resources of the computer and it is a component in Cloud computing where the operating system from the hardware is separated which is already working. With virtualization a single physical resource can be divided into multiple number of virtual resources or this may also work vice versa where the different resources are put together to form a single resource. Virtualization has brought a lot of change in the industry of information and technology organizations. Before the virtualization is not done, we get to see the OS image only on one machine and the hardware and the software in the machine are tightly coupled to each other. There is always a conflict on running one application on different machines which makes the system not so flexible and also the infrastructure becomes costly. The stress testing and the performance testing of the websites also needs the tools which can be used by n number of machines using virtualization.[7] But, as soon as the virtualization is done, we get to see many changes in the system like the independency of the operating system or the applications which run on the hardware. To use these shared resources, the virtual machines are used and these virtual machines can be provided to the systems to use the shared resources. [3] Load balancing is done using these virtual machines so that each node has similar load and for that further different algorithms are used. [4]

The difference between the before and after effects of virtualization or the working of virtualization can be diagrammatically shown as below:
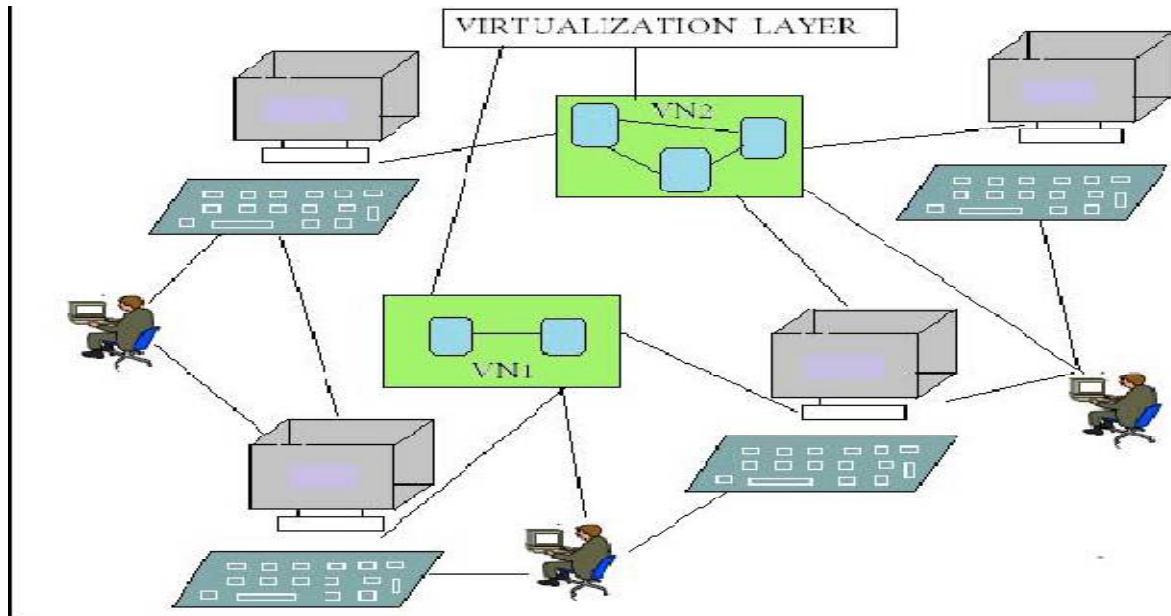
Fig.1 Virtualization Infrastructure

II. ROLE OF VIRTUALIZATION IN CLOUD

When we talk about the working capabilities, the virtualization or multitasking feature in operating systems have the same capabilities. A single physical machine is there and there are number of centralized virtual servers into that single machine. When there is more than one virtual server then if one closes or fails, even then that particular task does not stops because there is never the full resource usage. In this types of cases, virtualization can help because we can migrate from one machine to the another called migration which further helps in saving the energy and decreasing the cost which in turn helps the companies to get a larger profit.

To implement this virtualization, a layer of software is put between the hardware and the operating system of the virtual machine. This virtual machine provides standardized hardware resources like memory or network or memory to the virtual machine. [3]Data mining is another concept which uses Cloud Computing with virtualization. [5]

The virtual machines are exposed to many kinds of filtering assuring the security at a high degree. So, the virtualization is being used for the security component. Security in Cloud has many different instances. In this paper, we may discuss only about the virtualization security management. There are different options how we can manage the security of the data while the virtualization of the resources is being done. [6]

Hypervisor is categorized into two types: hosted and bare metal.

i) Hosted virtualization which is also said to be type 1 virtualization. Here the hypervisor is installed over the Operating system of the machine. This also supports the large range of hardware configuration as it runs over the operating system. So, there is an instance of operating system and there is a layer of hypervisor after the operating system on the hardware of the system. [3] This can be also explained with the figure below:
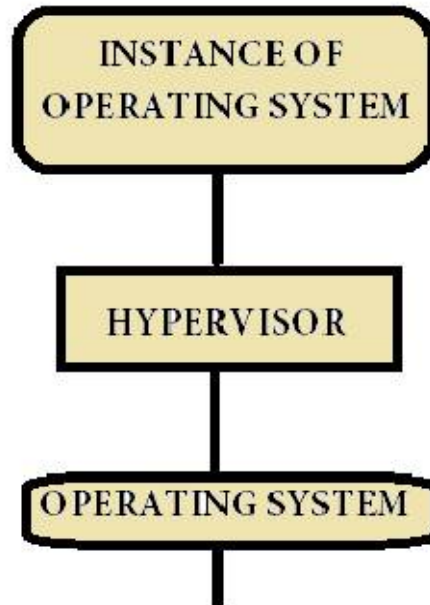
Fig.2 Hosted Hypervisor

ii) Bare metal hypervisor also known as type 2 hypervisor is used when some of the desirable instances are installed over the operating system. It is installed on the hardware with x86 and such type of hypervisor is used on desktop computers. [3] This type of hypervisor is more efficient.
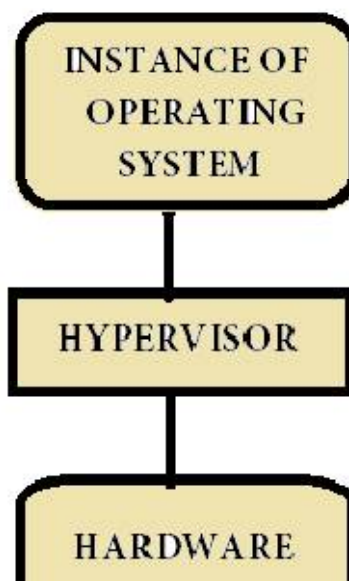

FIG.3 BARE METAL HYPERVISOR

III. VIRTUALIZATION STORAGE

In the era of cloud computing and internet, the biggest challenge we are facing is the storage of large amount of information or data.[6] We cannot afford loosing the data for few days as well. The companies may undergo a big loss. So to manage the data, virtual resources are used as they are much easier to maintain than the physical resources. The storage virtualization is of five types mainly: file, tape driver, file system, disk and block virtualization.[3] These may be explained as below:

i) File Virtualization: This enables the migration of the data less used to the secondary storage like disks or tape drivers. This type of migration can be done to both users and applications.

ii) Tape Virtualization: The open system users face a big problem to share physical tape drives and to share them among the number of hosts as many as possible. It is further of two types: Tape media and tape driver virtualization.

iii) File System: Here the file system servers manage the files in the shared network file access. All the users using the operating system use this file system.

iv) Disk virtualization: The capacity of the disk depends upon the number of cylinders it comprises of. A disk contains the cylinders, heads and sectors. It is the oldest form of virtualization which is implemented in various firm wares. This address is changed into the numbered logical blocks used by hosts and OS. This address is known as LBA (Logical Block address). If we need to measure the size of the disk, it can be done using this LBA.

v) Block virtualization: A virtual storage is created from the physical disk which is viewed what is required by the customer. This all can be met by getting together the different capabilities of block virtualization. If extra storage is needed then disk capacity is expanded and enlarged from what already exists.

IV. CONCLUSION

Virtualization is one of the most useful technology used to decrease the cost and to save the energy With Operating system virtualization, all of them are independent from each other. To isolate all the OS physically we need to use VMs to run different services on different machines.

Virtualization is such an element which helps you deliver the good value of cloud computing using VMwares.

REFERENCES

1. Artem Volokyta, Igor Kokhanevych, Dmytro Ivanov, "Secure Virtualization in Cloud Computing", TCSET'2012, February 21-24, 2012, Pg No.395
2. Narang, Ashima, and Vijay Laxmi. "Various Load Balancing Techniques in Cloud Computing.", IJCSMC, Vol. 3 issue9, Pg no 502-509, (2014).
3. Nancy Jain, Sakshi Chaudhary, "Overview of virtualization in Cloud Computing", CDAN, 2016.
4. Kaur, Karanpreet, Ashima Narang, and Kuldeep Kaur. "Load balancing techniques of cloud computing." International Journal of Mathematics and Computer Research,Vol1, issue3, Pg no 103-108 ,2013.
5. Sonamdeep , Sarika Chaudhary, " A survey- Clustering Algorithms in Data Mining", International Journal of Computer Applications, Cognition, Pg no 12-14,2015
6. A Narang, "A review-Cloud and cloud security" International Journal of Computer Science and mobile computing, Vol6 issue1,Pg no 1-4, 2017
7. Shivangi Kaushal, Jagpuneet Kaur Bajwa, "Analytical review of user perceived testing techniques", IJARCSSE,Vol2, issue 10,Pg no 213-216, 2012
8. Poonam sharma, Amit Wadhwa and komal "Analysis of Selection Schemes for Solving an Optimization Problem in Genetic Algorithm." International Journal of Computer Applications, Vol 93, issue11, Pg no 1-3, 2014.