Virtual Machine in Cloud Computing

Danial Khalid
(FA20-BSCS-046)

Musab Rizwan
(FA20-BSCS-053)

Abdullah Shahzad
(FA20-BSCS-010)

M. Abdur-Rehman
(FA20-BSCS-022)

ABSTRACT

In this project we will research about Virtual Machines in Cloud Computing. Why they are used and what are the benefits of using them. A brief introduction to Virtual Machine and virtual machine on a cloud computing is provided below.

A Virtual Machine is a compute resource that uses software resources instead of using physical computer's resources. It is usually an image embedded with the entire hardware configuration (virtualized), operating systems and tools of a computing machine. Operating Systems such as allows Windows, Linux, Mac or Solaris to be run on virtual machines (can be networked) without the requirement of rebooting the system or partitioning the hard drive.

The Virtualization software can be used to run multiple operating systems simultaneously on a single personal computer or on cloud with server.

With the help of Virtual Machine in Cloud Computing, it is possible to share resources between multiple visitors or Virtual Machines. Each will have its own operating system model. Two basic types of Visual Machine Process and System VM.

The virtual machine in Cloud Computing contains the remaining system. It means that certain software available within a particular Virtual machine in Cloud Computing has no access to escape or computer interference.

The main idea of this paper is to understand the concept of Virtual Machine in Cloud Computing. Virtual Machine provides a fully customizable set of hardware and can share resources with the help of a computer.

Afterwards, we will discuss features in cloud computing and much more in depth.

KEYWORDS:

Virtualization; Virtual machine; placement; migration; Virtual machines in cloud computing.

INTRODUCTION

Cloud Computing has turned into a typical practice these days. A few specialist organizations, like Amazon, Google, or Microsoft, among numerous others, give clients figuring power in the cloud. Along these lines, it isn't important to secure and keep up with equipment hardware however just to lease the expected administrations for a given measure of time.

One of these frameworks is OpenStack [1], which cements computing services with storage services and with the rest of services.

In a similar way too many supercomputers and data centers, cloud computing providers are increasingly adopting the use of Graphics Processing Units (GPUs). In this regard, Amazon, for example, provides virtual machine (VM) instances comprising up to 16 GPUs, although typically VM configurations providers only provide 1, 2, or even 4 GPUs per instance.

Usually, these accelerators are CUDA [2] GPUs, which have stood out above OpenCL [3] devices over time.

This functionality is based on the use of the virtualization extensions widely available in high performance cloud computing servers. These extensions allow to assign a GPU, in an exclusive way, to one of the VMs running in the host.

With the development of virtualization technology, virtual desktop has made great progress. At present, virtual desktop solutions are mainly divided into two categories: VDI (Virtual Desktop Infrastructure) and SBC (Server Based Computing) [4].

In conclusion, the cloud computing technology can improve following problems:

- The difficulty in the management and usage of heterogeneous systems
- Management and rapid deployment of various types or versions of OS
- Software development and transplant

To improve system reliability and fault tolerant performance

However, the virtual machine with such features increases system complexity and reduces the performance of specific operations. Meanwhile, challenges occur to the corresponding test.

Virtualization is one of the oldest areas of interest in computer science. One of the most successful examples of virtualization is the Java Virtual Machine (JVM) [5]. Using the JVM, the Java programming language produces identical results regardless of the different CPU instruction set architecture (ISA) that is used by the hardware platform. This is possible because the compiled Java code is running on the same machine in a virtual setting. As long as a system has a JVM installed, it will translate Java byte code into the appropriate ISA and the results will be identical.

The JVM allows one piece of virtual hardware to be present on multiple systems. Software like VMware allows multiple virtual hardware systems to be present on a single piece of physical hardware. Creating multiple virtualized environments on a single piece of physical hardware is one of the foundations of cloud computing.

These parallel virtual images are made possible by a hypervisor. Various types of virtualizations exist such as Client virtualization, Storage virtualization and Server virtualization in cloud computing.

Need, Benefits

- Multiple Systems: With virtualization we are able to run multiple applications on different operating systems while being on the same physical hardware.
- Power Management: Improves the power utilization.
- Resource Utilization: The resource utilization is increased with the virtualization.
- Load Balancing: Load is distributed on available resources.
- Maintenance and Servicing.
- It improves system availability.
- It is scalable, in accordance with the required time.
- Security is improved by running multiple servers in containerized environments.

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