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Evaluation of Multitask Feature in Storage and Virtualization

Srilakshmi Gorur, Dr. N. Sandeep Varma
Department of Information Science, B.M.S. College of Engineering, India

Abstract
Nowadays all the computing devices manufactured come with high computational power and storage. But these resources are never utilized to its maximum potential. Hence virtualization is at most important in all the components of a computing device. Simultaneously tasks can be processed using such resources which means multitasking can be done. Here only storage and virtualization are considered for evaluating the feature of multitasking. Hypervisors play an important role in managing efficiently the compute resources. Virtualization has become the most developing technology. Terms virtualization and multitasking can be used alternatively.

Keywords: *Virtualization, storage, hypervisor, utilization of storage and virtualization, process multitask*

INTRODUCTION

Virtual machines are software representation of an actual physical machine's functionality. The VMs need to run under the supervision of what is called a hypervisor, which will virtualize the hardware resource. Sharing the available hardware among multiple VMs as the request arises is multitasking feature. A hypervisor is a thin layer of software that helps in creating, managing and maintaining the virtual machines, they are also called virtual machine monitor. Hypervisors come in two types: Type-1, non-hosted or bare-metal and Type-2, hosted, as in Fig 1. The hypervisor that runs directly on the hardware or the bare-metal hardware is called as Type-1. While the Type-2 hypervisor runs on some operating system[5]. Examples of Type-1 hypervisors are VMware ESX, Microsoft Hyper-V, IBM Xen. Examples of Type-2 hypervisors are VMware Workstation, KVM, virtual PC.

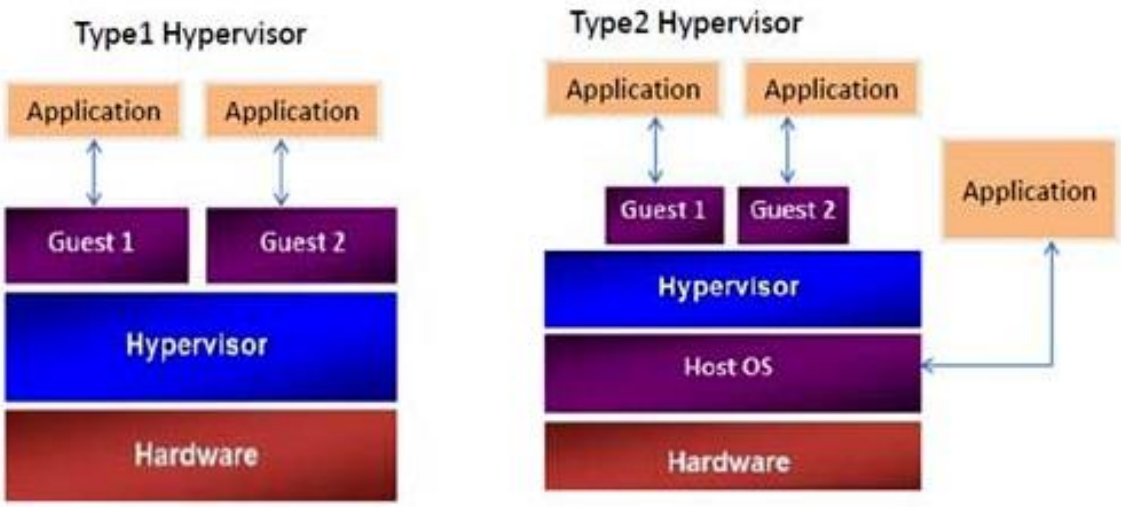

Fig 1. *Types of hypervisors*

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RELATED WORK

Several systems are designed which make use of virtualization to divide the sufficient resources in a computer. Certain systems require dedicated hardware else support for operating systems could be difficult[1]. The advantages being isolation of resource, guaranteed performance, provisioning of the VM. There are a few disadvantages like security glitches, speed and efficiency of the virtual machine.

Systems making use of storage virtualization and its methods allow clients to achieve storage as a service as opposed to storage being independent. There will be a mapping of virtual disk to a host system. The system that manages the process of virtualization will assign physical storage dynamically to server incoming I/O requests[2].

The hypervisor's role is to grant access to host's physical resources so that the VMs can utilize and share it among them. All the resources that a virtual computer will need is presented as virtual platform interfaces. The load balancing must be done optimally and efficiently[6].

PROPOSED APPROACH

The Role of virtualization

The working abilities of multitask systems and virtualization are of same capabilities. One physical system can host a number of virtual machines. Even if one VM fails or shuts down then then resource usage is not 100%. In these scenarios due to virtualization failover can be done with minimal cost and gain profit.

Virtualization implementation means a thin layer of software is present in between the hardware and virtual machine operating system[3]. Memory, Network and other hardware resources are presented to the virtual machine as a set. The security provided to each of the created virtual computers must be of very high degree.

Storage virtualization

In this advanced era of internet the major problem that exists is the storage of huge amount of data. Losing data is not at all affordable which may be a huge loss to the companies. Management of data and its virtual resources are easier to maintain [4]. There are a few types of storage virtualization: disk, block, and file. They are explained as follows:

Disk virtualization: Disk capacity is determined by the number of cylinders it contains. The disk comprises of cylinders, heads and sectors. The address will be translated into the numbered logical blocks used by OS and hosts. If we need to measure the size of the disk, it can be done using Logical Block Address.

Block virtualization: Making use of the physical storage disk a virtual storage is created. All this is possible due to the concept of block virtualization. If extra storage is needed then disk capacity is expanded and enlarged.

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.

System Architecture

A prototype has been developed which helps in resource management and multitask feature in storage and virtualized environments. Multiple rules need to be taken into consideration so as to avoid deadlock and starvation. The virtual machine placement service will communicate with the virtualization management service in order to retrieve performance data and execute migrations. There exists a collection of migration

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purviews which need to be managed which in turn have VMs and physical hosts. The placement service decides the policy for each migration domain.

Load sharing, traffic concentration and the like algorithms can be used in order to efficiently assign the resources and multitask them between the VMs that have the assigned resources. The workload in a virtualized application is session-based. At a given point in time there may be multiple concurrent requests can interact with the VM application. In case there is high demand for one VM and the others can share the resources, automatically the change must be seen. There must be a scheduler to manage all these activities of multitasking. This scheduler can be integrated with the hypervisor also.

CONCLUSION and FUTURE ENHANCEMENTS

Virtualization is the most beneficial technology that is used in order to spend less cost and to save energy. Operating system virtualization is independent from all the other types of virtualization. For operating systems to be isolated completely from each other they must be running on different servers. Virtualization helps to deliver the best value in terms of storage.

The concept can be extended to cloud scenarios as well. Some measures of security must be added in order to protect the data and identity of the users. Even though storage is shared among all users, each instance of the user must be isolated from each other.

REFERENCES

1. Aameek Singh, Madhukar Korupolu, Dushmanta Mohapatra, "Server-storage virtualization: integration and load balancing in data centers", Proceedings of the 2008 ACM/IEEE conference on Supercomputing Article No. 53
2. Richard Victor Kisley Philip Douglas Knight, "Distributed file serving architecture system with metadata storage virtualization and data access at the data server connection speed"
3. Edward T. Mooring, Phillip Yankovsky, "Systems and methods involving features of hardware virtualization such as separation kernel hypervisors, hypervisors, hypervisor guest context, hypervisor context, rootkit detection/prevention, and/or other features"
4. Thomas A. Phelan, Erik Cota-Robles, David William Barry, Adam Back, "Transparent virtualization of cloud storage"
5. Chris Hyser, Bret McKee, Rob Gardner, Brian J. Watson, "Autonomic Virtual Machine Placement in the Data Center", HP white paper
6. Lan Huang, Gang Peng, Tzi-cker-chiueh, "Multi-dimensional storage virtualization", Proceedings of the joint international conference on Measurement and modeling of computer systems, Page 14 - 24

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