Virtualization techniques in cloud computing

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Abstract- Virtualization is the main feature of cloud computing. It deals with the availability of computer resources to the user in efficient and easy manner. The computers resources are shared by many cloud users with the help of virtualization technique. The Virtualization is implemented with the help of software as well as hardware. Hypervisors are the software which are use to implement virtualization on cloud. The popularity of cloud is increasing very fast due to lots of benefits cloud computer caries. In this paper I will discuss the different techniques which are used to implement virtualization in cloud.

Keyword- Cloud, Virtualization, Hypervisors, Services

I. INTRODUCTION

Cloud computing is a technique or model in which all computer resources are made available to the user on pay per use basis. A cloud user can buy any computer resource as per his/her requirement for limited period of times. The cloud users can pay only how much resources are consumed by them and for how much time they have used them. Cloud can be deployed differently as per requirement. The cloud deployment model can be categorized as private cloud, public cloud, community cloud and hybrid cloud. There are various services which are provided on cloud by cloud service provider such as Software as a Service (SaaS), Platform as a Service (PaaS), Infrastructure as a Service (IaaS), Network as a Service, Security as a Service (SaaS) etc.

A. Cloud Deployment Models-

- *Public cloud-*
  A public cloud is design in such a way that it is always available for public to meet their service demands. Anyone can buy cloud resources from this type of cloud.
- *Private cloud-*
  A private cloud is designed for a specific organization to meet its requirements. In private cloud only the person of that organization can use private cloud and avail services available on private cloud.
- *Community cloud-*
  A community cloud is designed for a specific community such as musician, player, scholars etc.
- *Hybrid cloud-*
  A hybrid cloud is combination of two or more clouds. The participants of this cloud may private cloud, public cloud or community cloud.

B. Cloud Service Model-

- *Software as a Service (SaaS)-*
  The application softwares are provided to the cloud user as a service in Software as a Service (SaaS). The cloud users buy the applications or softwares as per their requirements through this service model.
- *Platform as a Service (PaaS)-*
  In these types of service model, platform is provided to cloud users so that cloud users can install and run their softwares on that platform.
- *Infrastructure as a Service (IaaS)-*
  In this type of service model infrastructure is provided to the cloud users so that the cloud users can use cloud's infrastructure. The cloud infrastructure includes processing power, network, storage etc.
- Security as a Service- In security as a service the security management of the organization is handled by cloud service provider. The cloud service provider is responsible to tackle all the threads and security issues of the organization which buy security as a service from cloud service provider.

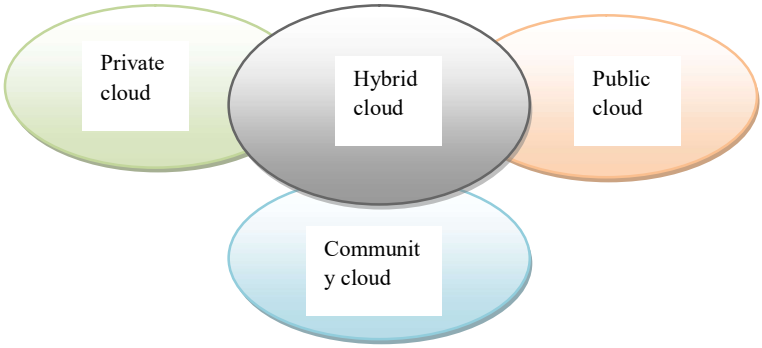

Figure 1. Cloud Deployment model

II. VIRTUALIZATION TECHNIQUES

Virtualization is a technique which is used for better utilization of server resources. Resource sharing is the main feature of cloud computing. Virtualization is implemented with virtual machine. Virtual machine is the software which makes duplication of real machine. Hypervisors are the software that has the capabilities to run multiple operating systems on single hardware host. Hypervisor is a low level program which is responsible to provide system resource access to virtual machine. There are two types of hypervisor, type 1 hypervisor and type two hypervisor.

A. Type 1 hypervisor-

This type of hypervisor exists between hardware and guest operating system. These types of hypervisor provide hardware virtualization. This type of hypervisor runs directly on system hardware. Figure 1 shows type 1 hypervisor.

B. Type 2 hypervisor-

These types of hypervisor exist on top of operating system. It can run only when operating system is already running. These types of hypervisor provide software virtualization. In this type of hypervisor the hypervisor exist between system hardware and operating system. If operating system fails then all the end users get affected.

Figure 2. Type 1 Hypervisor

Figure 3. Type 2 Hypervisor

C. *Full virtualization-*

Full virtualization is a technique in which a complete installation of one machine is run on another. This virtualization support different operating system but it requires specific hardware combinations. In full virtualization the hypervisor interact directly to computer resources. In this virtualization unmodified operating systems are used.

D. *Para virtualization-*

Para virtualization is a technique in which communication between hypervisor and guest operating system takes place in a manner to improve performance and efficiency. In para virtualization modified guest operating systems are used as per needed.

III.CONCLUSION

Virtualization is an abstraction for system resources in which system resources are utilized in best possible way. The cloud user think that they are using all system resources alone because of isolation provided by virtualization to each cloud user and. All system resources are made available to user as per their demand in cloud computing using virtualization. In this paper I discussed the techniques used to implement virtualization in cloud environment.

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