INTELLIGENT REDIRECTION OF VIRTUAL MACHINE AND EFFICIENT LOAD BALANCING IN PRIVATE CLOUD

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Abstract- Cloud computing is on demand as it provides flexible usage for reliable and efficient services for cloud consumers. In cloud computing, virtual machines are used for efficient utilization of physical machines which reduces LAN cabling, man power and concurrently supports green computing. The physical machine gets overloaded, during the utilization of resources limit exceeded. The Overloading of physical machines results in low performance of system which cannot satisfy the consumer's requirements. A proper scheduling method is used to overcome this problem. Through scheduling method, the virtual machine will dynamically migrate to the available node if the utilization of virtual machine exceeds limit of the resources. Thus the proposed system is used to minimize the overloading of physical machines, satisfy consumer's requirement and achieves load balancing in private cloud.

Keywords: cloud computing, green computing, load balancing, virtualization

I.INTRODUCTION

Cloud is a model for delivering information technology services in which resources are retrieved from the internet through web-based tools and applications, rather than direct connection to a server. Cloud is a rising technology which is built with a key term "virtualization". Virtual machines are developed under virtualization layer usingvirtualization technology Virtual machine is the one, where the resources of physical machine such as memory, CPU, network and hard disk are virtually configured to support the green computing. By developing virtual machines, we can avoid LAN cabling, man power and more space for physical machines. In this VM, operating system can be installed and run in computing environment.The architecture of cloud computing is shown below in Figure 1.

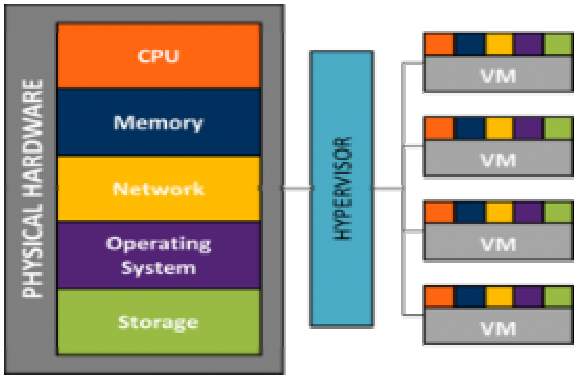

Figure.1 Cloud Architecture

Based on their use, virtual machines are classified into two types such as system virtual machine and process virtual machine. A system virtual machine provides a complete system platform which supports the execution of a complete Operating System (OS). A process virtual machine is designed to run a single program, which means that it supports a single process .When 'n' number of virtual machines is concurrently running on the same physical machine, it will results in unstable performance. To resolve this issue, migration and live migration of VM is introduced.

II.RELATED WORK

The Skewness algorithm is used to quantify unevenness in the utilization of multiple resources on a server.The load in a server categorized them as hot spot, warm spot and cold spot. The Virtual machineload are monitored in a server. Hot spot VM are eliminated by migratingthe VM to warm spot or cold spot and achieves green computing. The capacities of servers are well utilized [1]. Hot spot virtual machines are selected and migrated to selected node when the resource utilization of host exceeds certain threshold value [5]. Energy consumption and migration downtime of VM has been analyzed. The amount of necessary energy during migration is reduced using dynamic adaptation of computing resources and more migration criteria has been compared using clustering algorithm [7]. The VM migration downtime is reduced using a novel approach check pointing / recovery and trace / replay (CR/TR). Better performance compared with precopy approaches in a LAN up to 72.4 percent is achieved on migration downtime and 31.5 percent on total migration time which results better performance than precopy approach [6].

II.PROPOSED WORK

Load balancing is achieved by migrating virtual machine, when there is exceeding utilization of resources in private cloud. In this paper, under the host, multiple virtual machines are created with resources such as memory, CPU, network and hard disk. These resources are managed by virtualization layer which translates the request to the underlying physical hardware.

A. Automatic redirection of Virtual machine :

Virtual machines are dynamicallymigrated to another host which has sufficient space, when utilization of resources exceeds the limit. Physical machines (node) are registered under clustering environment .The Model of invasion system is shown in Figure 2. It describes the system client and server part. The request from the client is sent to the server through private network. In the server side, requested resources such as memory, CPU, hard disk and bandwidth are provided to consumers.

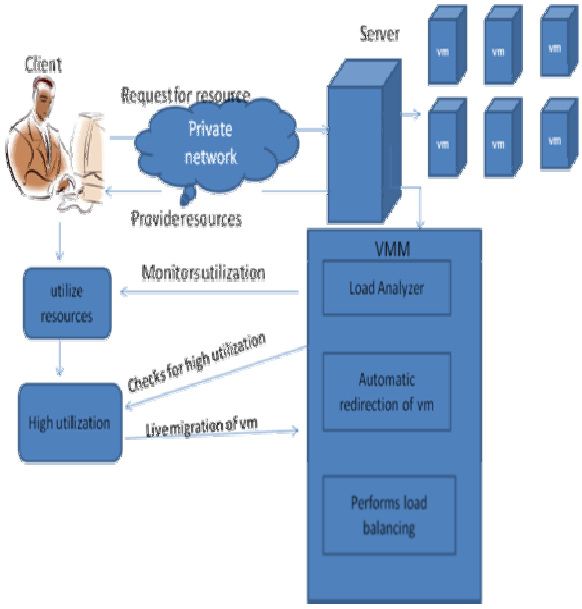

Figure. 2 Proposed System Model

When the client starts utilizing the resources, the server will monitor for over utilization of resources. If the resource utilization exceeds the limit, then the virtual machine will dynamically migrate to another node. The virtual machine will migrate dynamically to another host which has available space. This achieves load balancing and satisfies the consumer's requirement.

In this paper, the main objective of proposed idea are:

- To achieve load balancing.
- To minimize overloading of physical machine.
- To maximize performance of the system.
- To maximize customer satisfaction level.

IV.IMPLEMENTATION

Initial stage of this paper is private cloud setup . Virtual machines are configured with specific resources such as memory and CPU. In the virtualization (VT) enabled machine, the private cloud was created by using a tool OpenNebula 3.8.1.Ubuntu 12.04 LTSis used as operating system. OpenNebula act as a cloud controller which controls various host machine. For our implementation, we need to configure two hosts to migrate the virtual machine from one node to another node. For a single host, 2 GB RAM and 50 GB hard disk is the minimum requirement. A server is needed for each host to connect with other host under clustering environment.Data storage is used here to store disk image for VMs. Using a single image, multiple virtual machines are created using virtualization technology. Virtual machines are configured with resources such as CPU, 64 Mb MEMORY and BANDWIDTH. This process implementation is shown in the Figure 3.

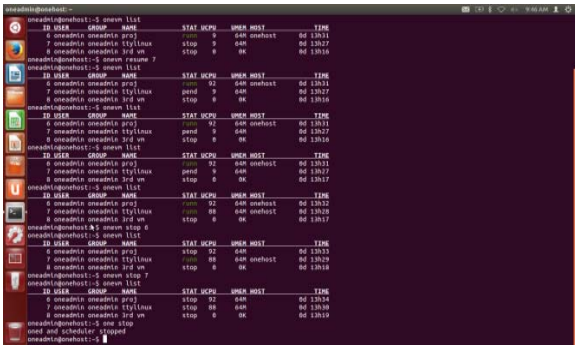

Figure. 3 List Of VM

With running virtual machine in a private cloud, consumers can utilize the resources which are provided. When the client exceeds the resource utilization, manually we can migrate virtual machine from one host to another host. Migration process of virtual machine can be monitored using Virtual Network Computing (VNC). OpenNebula Sunstone is the OpenNebula cloud operation center, a GUI for regular users and administrator that simplifies the typical management operations in private cloud.

V.CONCLUSION

Load balancing is achieved by dynamic migration of the overloaded virtual machines. Through migrating virtual machines to available nodes dynamically, overloading of physical machines can be avoided. This can be achieved through a scheduling method. Thus overloaded virtual machine under the host is migrated to available node using our proposed algorithm. By migrating overloaded virtual machine dynamically, performance of the system is maximized and results in high customer satisfaction at data centers.

VI.FUTURE WORK

In future, we will develop a scheduling algorithm. This algorithm should have criteria for selecting a VM, selecting a node which has sufficient space for overloaded virtual machines. Also, a module is developed to identify average resource load in a node and based on which schedule, the VM's will migrate dynamically to the available node. This ensures Load Balancing in private cloud.

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