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Snapshot view manager for VMware

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Abstract: In vCenter the Storage view of Datacenter shows the Virtual Machines (VMs) having snapshots. The number of snapshots and the space and description of each snapshot is not shown in any which way by vCenter. VM folder or vmx which are present in datastore but not in inventory occupies unnecessary space at times too. As a result, at times it becomes difficult for the database administrator to manage the entire datacenter and keep a watch over the number of snapshots taken and memory storage utilised by them.

In this project, we are proposing to build a dashboard where snapshot information for each VM and information about non-provisioned VMs would help Datacenter administrator to manage the datastore space in an improved manner. VIX api/vAPI/vmrun can be used to gather info about snapshots.

Keywords: vCenter server, snapshots, vSphere client, ESXi Hypervisor.

I. INTRODUCTION

1. Purpose:

In this project, we are proposing to build a dashboard where snapshot Information for each VM and information about non-provisioned VMs would help Datacenter administrator to manage the data store space in an improved manner. VIX api/vAPI/vmrun can be used to gather info about snapshots.

2. Product Overview:

VMware snapshot is the one kind of product which represents state of virtual machines including the files and memory state of a virtual machine's guest operating system. It also includes the settings and configuration of a virtual machine and its virtual hardware.

A single point of control to the datacenter is provided by vCenter Server. The essential datacenter services such as ease of access control, watch over resources utilization, monitoring of entire system performance and configuration of VMs are provide by it. The process of unification of the resources from the individual computing servers to be shared among virtual machines in the entire datacenter is realized by the vCenter Servers [2].

In the current database vCenter inventory, the administrator can just see the storage utilized by each Server. Thus it becomes difficult to administer the multiple snapshots taken for different Virtual Machines on multiple servers which in course adds on the unnecessary storage space and increases the hassles for administrator.

In this product we are developing new plug-in to help administrator to manage storage taken by each snapshot.

II. REVIEW LITERATURE

1. VMware vSphere:

The power of virtualization provided by VMware vSphere helps to transform datacenters into simplified cloud computing infrastructures using which flexibility as well as reliability in IT services can be provided by IT organizations. VMware vSphere virtualizes and helps to utilize the underlying physical hardware resources across multiple systems and provides plethora of virtual resources to the datacenter [1].

The vSphere Client is used for the configuration of the host and to manage and operate its virtual machines. The beauty is that it can be downloaded from any host. As a cloud based operating system, a large collections of infrastructure (such as RAM, processor, disk, and networking) as a seamless and dynamic operating environment is managed by VMware vSphere, also it manages the complexity of a datacenter [1][10].

2. VMware vCenter Server:

A centralized management hub to monitor the datacenters is provided by VMware vCenter Server. The aggregated physical resources from multiple ESX/ESXi hosts is presented as central inventory of simple and dynamic resources by the vCenter Server to the system administrator which in turn are allocated to virtual machines in a virtual environment.

A central place of management of virtual infrastructure is provided by vCenter Server. Using it, IT administrators are ensure security, reliability, scalability, simplified daily tasks, availability of usually unutilized resources and reduced complexity of managing virtual infrastructure [2].

The various vCenter Server components are user access control, central core services, distributed services, plug-ins, and various interfaces. Using the User Access Control Component, the system administrator can manage and configure different level access permission on vCenter Server to varied classes of users.

3. ESXi Hypervisor:

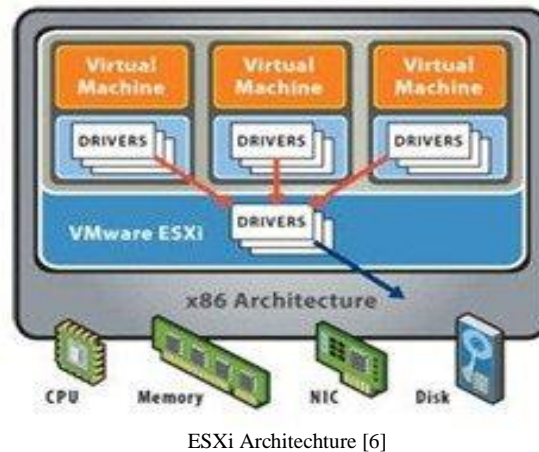
Wherever Times is specified, Times Roman or Times New Roman may be used. If neither is available on your word processor, please use the font closest in appearance to Times. Avoid using bit-mapped fonts if possible. True-Type 1 or Open Type fonts are preferred. Please embed symbol fonts, as well, for math, etc.

VMware ESXi provides the foundation for building a reliable, secure and dynamic IT infrastructure. VMware ESXi hypervisors are operating systems using which the resources such as processor, ram, storage, and networking on a server can be allocated to multiple virtual machines that can run unmodified operating systems and applications.

VMware ESXi are the most widely deployed hypervisors on servers, which delivers the highest levels of reliable, secure and optimum performance to companies of all sizes. The latest hypervisor architecture from VMware is VMware ESXi. It has an ultra thin architecture with no reliance on a general purpose OS, yet still offers all the same functionality and performance of VMware ESX.[7]

It provides a new scale of security and reliability because its coded base is smaller in size that represents a comparatively smaller surface to attack with lesser code to patch. This functionality of small footprint and hardware-like reliability enables VMware ESXi to be built directly into industry standard x86 servers from leading server manufacturers such

as Dell, IBM, HP, and Fujitsu-Siemens. The system configurations of VMware makes it the easiest way to get started with VMware virtualization [6][7].



ESXi Architecture [6]

4. What is Snapshot?

A snapshot preserves the state and data of a virtual machine at a specific point in time[8]. The state includes the virtual machines power state (for example, powered-on, powered-off, suspended)[8]. The data includes all of the files that make up the virtual machine. This includes disks, memory, and other devices, such as virtual network interface cards[8]. A virtual machine provides several operations for creating and managing snapshots and snapshot chains. These operations let you create snapshots, revert to any snapshot in the chain, and remove snapshots. You can create extensive snapshot trees[8].

In VMware Infrastructure 3 and vSphere 4.x, the virtual machine snapshot delete operation combines the consolidation of the data and the deletion of the file. This caused issues when the snapshot files are removed from the Snapshot Manager, but the consolidation failed. This left the VM still running on snapshots, and the user may not notice until the data store is full[8][9][11].

5. What products use the snapshot feature?

In addition to being able to use snapshot manager to create snapshots, snapshots are used by many VMware and third-party products and features [8]. Some VMware products that use snapshots extensively are:

- VMware Data Recovery[8]
- VMware Lab Manager[8]
- VMware vCenter and the
- VMware Infrastructure Client (Snapshot Manager, Storage vMotion)[8]

III. EXISTING SYSTEM

1. Current scenario:

The vCenter Server provides a single point of control to the datacenter. It provides essential datacenter services such as access control, performance monitoring, and configuration. It unifies the resources from the individual computing servers to be shared among virtual machines in the entire datacenter [4][5].

In the current database vCenter inventory, the administrator can just see the storage utilized by each Server. Thus it becomes difficult to administer the multiple snapshots taken for different Virtual Machines on multiple servers which in course adds on the unnecessary storage space and increases the hassles for administrator[4][5]. Even single VM's snapshot we can't see in vCenter.

2. Drawbacks of Current System:

In vCenter, snapshot created by vCenter only shows the total space occupied by connected VMs. It doesn't have the facility to show a centralized view of the storage spaces utilized by snapshots of various virtual machines.

In a huge Datacenter where there are thousands of snapshots taken on hundreds of virtual machines, it becomes real difficult from administration point of view to keep a eye on all the virtual machines and free up the unnecessary storage space occupied by snapshots.

To simplify this we have proposed a simple application interface which provides a centralized view to manage snapshot.

IV. IMPLEMENTATION

1. Architecture

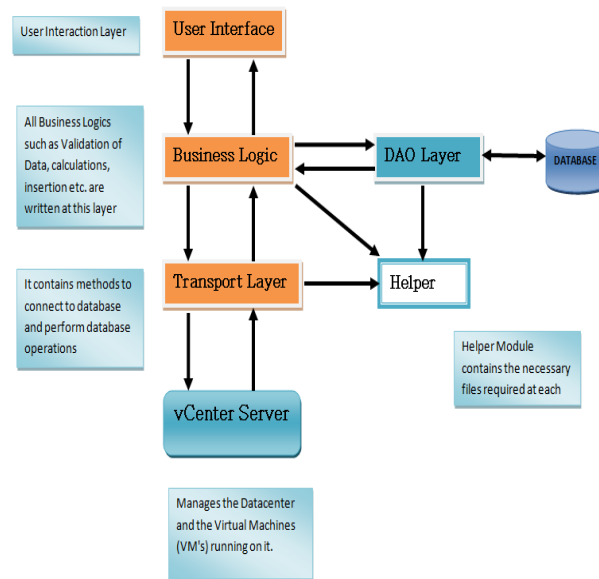


Fig. Three tier Architecture of proposed System.

User interface: An interface by which the user will interact to the system.

Business Logic: A layer where all operations related to snapshots are to be done. It is layer where the logic to fetch information about snapshots is coded to provided to UI.

Transport Layer: This layer works as a transport to user commands to vCentre and snaps from vCentre to Business Logic and UI.

VCentre Server: It is the central server which manages datacenters. We fetch data related to snapshots from here.

Helper Module: It is a module where common functions which are required any time, are stored. It helps to provide those functions whenever needed.

Database: It is an optional database, to store information about the latest accessed snapshots.

2. Purposed Plug-in View:

ESXI	Virtual Machine	Power Mode	No of SNAPS	Storage for snaps.
1.	VM1	ON	4	10GB
	VM2	OFF	5	15GB
2.	VM1	OFF	7	16.5GB
	VM2	ON	2	10GB
	VM3	ON	5	17GB
3.	VM1	OFF	1	3GB

3. Advantages of Purposed System:

1. The plug-in we are going to develop is able to show details about each VM to the administrator.
2. Plug-in will be able to show state of plug-in along with number of snapshot taken by each VM.
3. It will be also view the storage used by each VM.
4. Managing the resources becomes easy for administrator.

V. CONCLUSION

This paper presents a new system in virtualization technology. This system will provide additional functionality to administrator for resource optimization and management using which the simplicity to operate the VMware products will increase.

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