Role of cloud manager to provide secure storage service in cloud

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Abstract— Reducing costs, accelerating processes and simplifying management are all vital to the success of an effective IT infrastructure. Companies are increasingly turning to provide more flexible IT environments to help them realize these goals. One such solution is Cloud Computing. Cloud Computing enables tasks to be assigned to a combination of software and services over a network. For example storage of large data in cloud reduces costs and maintenance. Archiving of data makes this possible for organization to preserve their data in cloud storage for future use. To preserve data for long time cloud environment must be secured and scalable. This paper introduce to a new prototype that can help for easy archiving using cloud environment.

Index Terms—Cloud storage, Cloud Manager, Cloud Manager Orchestration Server, Multi-Tenancy, Virtual Machine.

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I. INTRODUCTION

This paper includes the current traditional environment used for backup and preservation of database. Within an organization database might reside on different nodes and sensitive data like password and other personal and private information must be secured. Since in cloud storage an user does not know where their data resides, one should know about privacy policy and cloud provider must ensure for data integrity and security. Another difficulty that is faced for cloud provider is that it has to support multi-tenancy that is important and crucial as well. Data resources may be located in different virtual storage environment. This paper shows a proposed architecture that fulfils the requirement of multi-tenant and different virtual storage using a cloud manager. This paper illustrates the flow of data from different virtual storage and easy group system [8] [13].

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II. COMPARISON

Table 1

Traditional storage	Cloud Storage
1) Lower Latency	1) Higher latency
2) Power and cooling cost	2) Only service provider's cost
3) Administration cost	3) WAN cost(if using hybrid/public cloud)
4) New technology adoption	4) From one provider to another

Above table shows the comparison between traditional archiving system and cloud storage. We can see that the cloud storage is advantageous as per its basic characteristic user/customer will have to pay per use only and no other maintenance cost will be wasted.

A. Archiving in cloud

Dynamic File Services enables you to manage your unstructured data with intelligent tiering in Microsoft Active Directory and Workgroup environments.

Dynamic File Services can help reduce storage infrastructure costs, save work hours, enhance existing investments in storage hardware and software, and improve retention compliance.

Archive data to Amazon S3, Box, CloudMe, or Dropbox, using our intelligent policy engine to identify unstructured

data (files & folders) hosted on Microsoft network shares, including a variety of third-party Storage platforms from leading hardware vendors, including Dell, EMC, HP, and NetApp.[14]

Dynamic File Services retention pairs allow you to keep data that is actively used On-Premises, and move static data that's only occasionally needed to a retention repository off site to the cloud. For example, the repository can store files that are not needed for everyday operations but must be retained for historical reference, or to comply with contractual or legal requirements.

III. PROPOSED ARCHITECTURE

As shown in fig 2, the proposed architecture contains cloud manager. And Cloud Manager consists of two main components: the Cloud Manager Application Server and the Cloud Manager Orchestration Server. The Cloud Manager Application Server and the Cloud Manager Orchestration Server sit on top of your virtual infrastructure to automate Cloud services for your customers.

- *Cloud Manager Application Server*

The Cloud Manager Application Server provides the portal for initiating and managing storage services. When a customer requests a storage service through the Application Console, the Application Server sends instructions that the Orchestration Server uses to provision the service's workloads (virtual machines) through the virtual infrastructure technologies.

- o *Application Console*: A Web application that can be run on any computer with a supported Web browser. The console is for both Cloud Manager Administrators and users. Cloud Manager Administrators use the console to organize computing resources so that users can consume them as storage services. Users access the console to request and manage storage services. Login to the console occurs through an LDAP directory designated as the authentication source.

- o *Application Server*: Supports the Application Console and communicates with Orchestration Servers to provide instructions for deploying, managing, and removing storage service workloads. It also performs user authentication with the LDAP source.

- *Cloud Manager Orchestration Server*

The Cloud Manager Orchestration Server automates the creation and management of storage service workloads in the virtual infrastructure. When the Orchestration Server receives a storage service request from the Application Server, the Orchestration Server directs the creation of the service's workloads from the appropriate VM template and the deployment of the workloads to the appropriate VM host. In addition, Cloud Manager Orchestration Server discovers and surfaces your virtual infrastructure resources (hypervisor technologies, VM hosts, VM templates, and so forth) in the Cloud Manager Application Console so that you can organize them into the catalog components that customers use to build their storage services.

- o *Orchestration Server*: Receives workload instructions from the Application Server and directs the creation and management of those workloads by the virtual infrastructure. Depending on the size of your virtual infrastructure, you might have one or many Orchestration Servers.

- o *Cloud Manager Orchestration Console*: Monitors and manages the activity of the Orchestration Servers, enabling you to view and troubleshoot jobs associated with workload creation and management.

- o *Cloud Manager Orchestration Agent:* Provides communication between the Orchestration Server and the VM hosts managed by the server. The hypervisor technology (vSphere, Citrix Xen, Hyper-V, SUSE Xen, and KVM) determine where the agent is installed.

- *Virtual Infrastructure*

The virtual infrastructure forms the foundation of the Cloud Manager physical topology. The hypervisor technologies (VMware, Citrix XenServer, Microsoft Hyper-V, SUSE Xen, and KVM) virtualize the underlying physical resources and enable the creation and management of virtual machines. The virtual infrastructure components are dependent on the hypervisor technology. The illustration shown above does not represent all components of the virtual infrastructure (such as networks, storage, virtual machines, and so forth). It is intended simply to show how the Cloud Manager components sit on top of your virtual infrastructure and interact with it to provide cloud services. The Cloud Manager documentation assumes that the person who will implement Cloud Manager is knowledgeable about your virtual infrastructure components and management. Refer to your hypervisor documentation for information.

Cloud Manager turns your virtual infrastructure into a Cloud environment that provides automated storage services to your customers. The Cloud environment consists of a variety of components.

Some of the components, such as zones and resource groups, provide ways to organize your virtual infrastructure resources so that Cloud Manager knows where to run storage services. These components are mostly hidden to users. Other components, such as service levels and workload templates, form the core of storage services and are readily visible to users.

❖ *Zones and Resource Groups*

A Cloud Manager zone is an Orchestration Server and its managed resources (hosts, clusters, resource pools, networks, storage, and so forth). Within a zone, these resources are organized into resource groups, as shown in the following Figure 3.

A resource group identifies a collection of hosts (and their associated networks and storage). When a workload is deployed, it is assigned to the resource group and provisioned using any of the resources within the group.

A resource group has the following characteristics:

- ✓ Supports only one hypervisor (VMware vSphere, Citrix XenServer, Microsoft Hyper-V, SUSE Xen, and KVM).
- ✓ Can include standalone hosts and clusters. Optionally, a resource group can be a vSphere resource pool. All host or pool resources (CPUs, memory, networks, disks, and so forth) should provide the same performance level so that a workload can run equally well on any of the resources.
- ✓ Cannot span zones. All resources in the group must reside in the same zone.
- ✓ Cannot share storage repositories with other resource groups.

❖ *Workload Templates*

Workload templates are used to create storage service workloads. A workload template defines the following:

- ✓ The VM template used to create the workload.
- ✓ Resource customizations to apply to the workload. For example, if the VM template provides 2 CPUs, you can increase that number to 4 CPUs.

- ✓ The license and setup costs associated with a workload created from the template.

IV. TERMINOLOGY

I.   Approver
 A Cloud Manager role that provides Application Console rights to approve or deny storage service requests based on available resource capacity for an organization or zone.

II.   Build Administrator
 A Cloud Manager role that provides Application Console rights to complete pre-build and post build configuration for workloads in requested storage services.

III.   Business Group
 A business group can be assigned all or some of the organization's resources (such as its hosts, templates, and networks) to use for deploying storage services. A business group might represent a cost centre or a department that needs to deploy storage services. When organization members are associated to one or more business groups, they are assigned rights to use the resources that the business groups provide.

IV.   Business Group Viewer
 A Cloud Manager role that provides Application Console rights to view storage services for a business group.

V.   Storage service
 It is a collection of workloads that are deployed together.

VI.   Storage service Owner
 A Cloud Manager role that provides Application Console rights to create, modify, and delete storage services for an organization or for specific business groups within an organization.

VII. Catalog Manager
 A Cloud Manager role that provides Application Console rights to create, modify, and delete workload templates.

VIII.   Cloud Administrator
 A Cloud Manager's role is that it provides Application Console rights to perform all tasks.

IX.   Host
 A computer is (that is, a physical machine) that can host one or more virtual machines (VM).

V. SECURITY CONSIDERATION

Although the Cloud Manager Orchestration Server has its own user database and authentication mechanism, it also allows integration with an existing Lightweight Directory Access Protocol (LDAP) system for authenticating user credentials [10].

VI. CONCLUSION

Here, we conclude that by using this architecture for achieving process in cloud can be more practical and it can be secured as we can use LDAP for authentication at Orchestration server level. And the proposed architecture can be proved highly efficient for rapidly scalable organization as we can manage workload templates.

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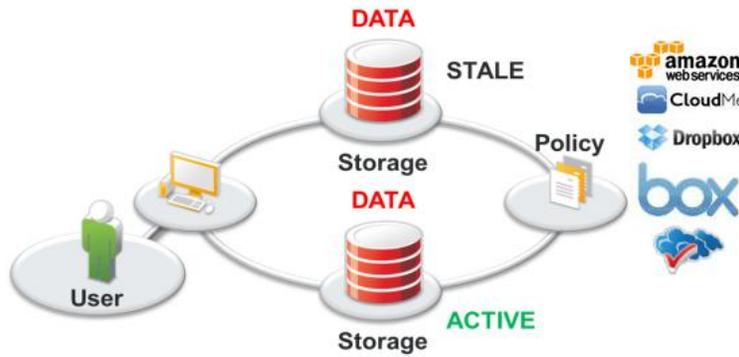13. http://www.wwpi.com/index.php?option=com_content&view=category&layout=blog&id=318&Itemid=2701721
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LIST OF FIGURES

Figure 1 Archiving process in cloud
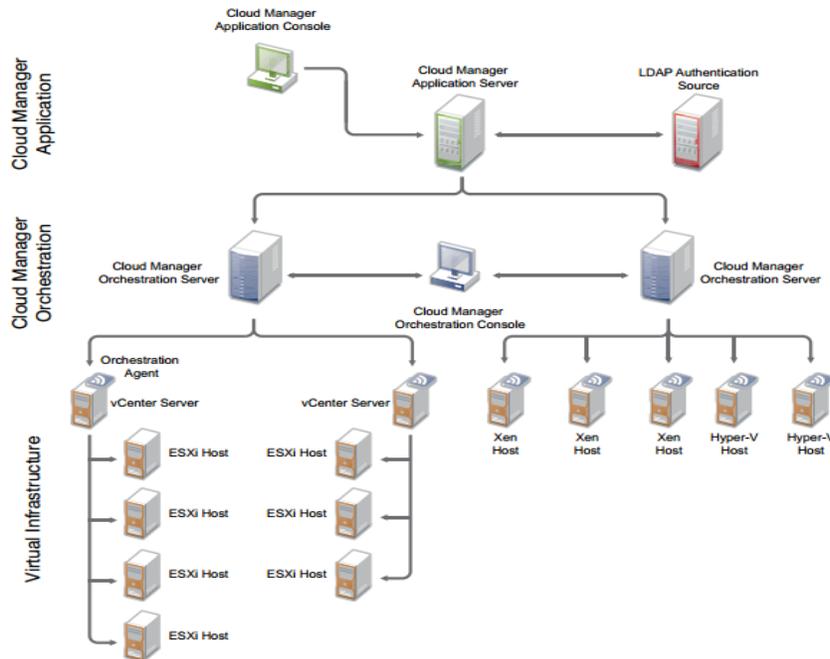
Figure 2 Cloud manager Application system [9]

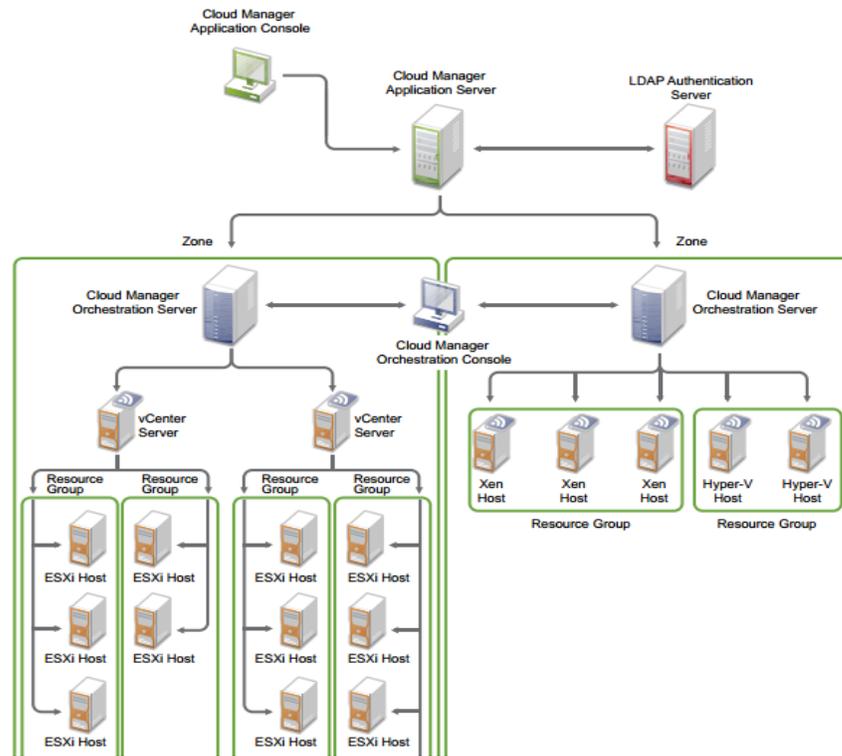International Journal of Research in Computer Engineering and Electronics.   Page # 6
VOL :2 ISSUE :1

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Figure 3 Cloud manager resource group [9]