Virtual data center powered virtual machine

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Abstract— **Cloud computing, is a colloquial expression used to describe a variety of different types of computing concepts that involve a large number of computers connected through a real-time communication network such as the Internet. Cloud computing is a term without a commonly accepted unequivocal scientific or technical definition. The phrase Cloud Computing is also used to refer to network-based services which appear to be provided by real server hardware, which are served up by virtual hardware, simulated by software running on one or more real machines. A Virtual Data center is a pool of cloud infrastructure resources designed specifically for enterprise business needs. Those resources include compute, memory, storage and bandwidth. Cloud-based apps can be up and running in days or weeks, and they cost less. Such virtual servers do not physically exist and can therefore be moved around and scaled up (or down) on the fly without affecting the end user - arguably, rather like a cloud. A virtual machine typically emulates a physical computing environment, but requests for CPU, memory, hard disk, network and other hardware resources are managed by a virtualization layer which translates these requests to the underlying physical hardware. They are termed as Virtual Machines**

Index Terms—**Cloud Computing, VDC- Virtual data center, VMI- Virtual machine instance, VM- Virtual Machine, AWS- Amazon web services, EC2- Elastic Cloud Compute 2.**

I. INTRODUCTION

What is Cloud Computing? Is it utility computing? Is it an application service provider's offering? Is it virtual machines in the sky? Are some of the general questions that arise when we use the term —cloud computing? All of these are correct depending on who you ask. Generally, Cloud Computing can be defined as —Anything that involves delivering hosted services over the Internet. These services are broadly divided into three categories: Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS) and Software-as-a-Service (SaaS). The name cloud computing was inspired by the cloud symbol that's often used to represent the Internet in flowcharts and diagrams.

Berkley simply defines Cloud Computing as —Pay as you go SaaS because Cloud Computing refers to both the applications delivered as services over the Internet and the hardware and systems software in the datacenters that provide those services. The services themselves have long been referred to as Software as a Service (SaaS), so it is used. The datacenter hardware and software is what a Cloud is called. When a Cloud is made available in a pay-as-you-go manner to the public, it is called Public Cloud; the service being sold is

Utility Computing. Private Cloud refers to internal data-centers of a business or other organization that are not made available to the public. Thus, Cloud Computing is the sum of SaaS and Utility Computing, but does not normally include Private Clouds.

A cloud service has three distinct characteristics that differentiate it from traditional hosting. It is sold on demand, typically by the minute or the hour; it is elastic -- a user can have as much or as little of a service as they want at any given time; and the service is fully managed by the provider (the consumer needs nothing but a personal computer and Internet access). Significant innovations in virtualization and distributed computing, as well as improved access to high-speed Internet and a weak economy, have accelerated interest in cloud computing.

So Core features of cloud computing are scalable, centrally managed and accessible via the internet. Cloud computing boils down to running software on someone else's robust hardware in a data center somewhere else (someone else's software on someone else's hardware in someone else's data center). Another key component has become a very low barrier to entry in both technical and financial terms. The service should be very easy to begin using and it should be very cheap and/or free (at least at a basic level). The general approach to pricing for most cloud platforms, so far, has been a per usage or subscription basis. Per usage charges you only for what you actually use. If you use a virtual machine, you will pay a certain amount for every CPU hour consumed; for storage you will pay by the gigabyte or terabyte. You will usually have to pay some kind of bandwidth/networking costs.

A cloud can be private or public. A public cloud sells services to anyone on the Internet. (Currently, Amazon Web Services is the largest public cloud provider.) A private cloud is a proprietary network or a data center that supplies hosted services to a limited number of people. When a service provider uses public cloud resources to create their private cloud, the result is called a virtual private cloud. Private or public, the goal of cloud computing is to provide easy, scalable access to computing resources and IT services.

II. AIM AND OBJECTIVES

Virtual Machine simulation and creation is a topic that has been addressed in several computing areas like datacenter management. Virtual Machine System in Cloud Computing are often seen as any mechanism that aim is to ensure that the application's needs are attended properly by the provider's infrastructure. In conjunction with this guarantee to the

developer, creation of cloud instance mechanisms ought to additionally take into account the present status of every resource within the cloud environment, so as to use algorithms to better allocate physical and/or virtual resources to developers' applications, there fore minimizing the operational cost of the cloud environment. In the present work we argue that the objectives to be designed for a cloud environment, that operates successfully on given the challenges of Cloud Computing World.

- Develop user friendly, simple environment for the creation of cloud instance/virtual machine in Amazon Servers
- Availability of features to users like automated provisioning, and manages any number of cloud instances on a single pane of glass, which has to reduce the time required to provision from up to two days to less than one hour.
- Developers can access the infrastructure cloud from any device with network connectivity, whenever and for however long needed at little to no cost to the developer.
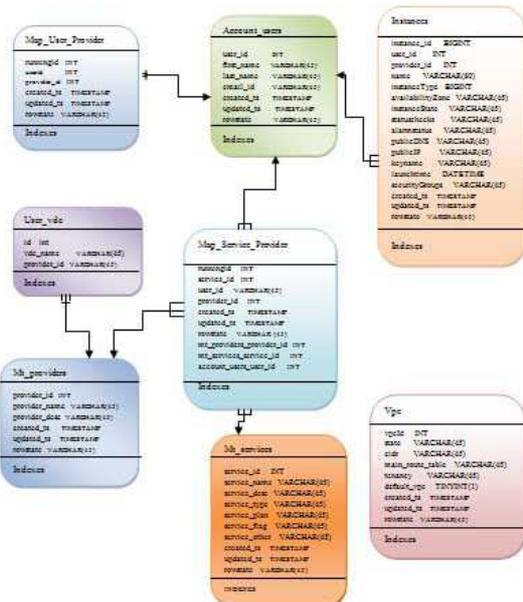
III. SYSTEM DIAGRAM

Figure 1: Data flow diagram.

IV. SYSTEM IMPLEMENTATION

1. Virtual Cloud Production

The Concept of Virtual Data Centre can be termed for more than one cloud data centres. For example consider an organization is hosting its applications or using infrastructures from different cloud providers or same providers with different multiple accounts then it will be very difficult to manage all the data centres at one place. Here I have tried to implement a concept of "Single pane of Glass", where a cloud user/customer can organise, manage multiple cloud accounts on our platform. Creation of a platform for management of VDCs at one place provides optimized choice and control across public and private cloud computing services to empower users to get the most out of cloud while minimizing business risk.

2. AWS Management with AmazonEC2App

Most organizations are dealing with rogue or shadow IT, specifically with Amazon Web Services (AWS). Even if you are not aware of it, it is happening. In the Forrester report "Tracking the Renegade Technology Buyer," it is reported that 92% of business decision makers are spending a portion of their own budget on technology services, products or staff.

Why are business decision makers going around IT? It's simple: they value speed and agility over everything else. Business leaders recognize that technology can give them a competitive advantage, and they won't wait for IT to deliver a solution so they are going directly to public cloud services.

3. New Risks

But this new-found agility comes with new exposures that the business may not be aware of or is ignoring. Yet, IT may be held responsible for these exposures:
GROUP MANAGE ANALYSIS

- What accounts do I have in AWS?
- Can Multiple Accounts be managed in a Single Pane?
- Are company processes being followed?
- Is my cloud app Managed with ease?
- Can we have access to maintain multiple virtual instances of cloud account?
- What about multiple Cloud Accounts with multiple virtual instances?
- How to build a Cloud Dashboard ?
- What business unit?
- On what Cloud Account?

4. The Solution

Discovery: The first step of gaining control is discovery of what your organization is doing in the public cloud. With AmazonEC2App IT can determine what cloud assets are provisioned in the cloud as well as how secure and resilient the architectures are. With this app, customers can have complete visibility in these accounts.
Control: With this app, IT can now provide governance over cloud activities while still allowing speed and agility for business users. Also gain good visibility and control across public clouds on the Cloud.

5. Configure VDC

The Virtual Machine creation for an organization can vary in terms of hundreds, to manage smoothly on one single pane of glass, there need a platform to manage large number of virtual machines of different accounts, different domains,

different business needs and organizational structure. In that regard we categorize the virtual machines based upon cloud accounts and user needs, our tool facilitates the user to create virtual data centre and associate virtual machines to VDCs

6. Manage VM

Pool of virtual machines from virtual data centre can be managed. The properties of Virtual machine can be visualized. VMs can be Started, Stopped and Terminated from the user interface of our portal without any configurations required. The tool is simplified and can be used for cloud operations with ease and hassle free.

7. Constraints

The tool currently has large scope with multi tenancy database application. But due to limited accessibility of Cloud accounts here we limit our representation of our demo to single account and any number of virtual machines.
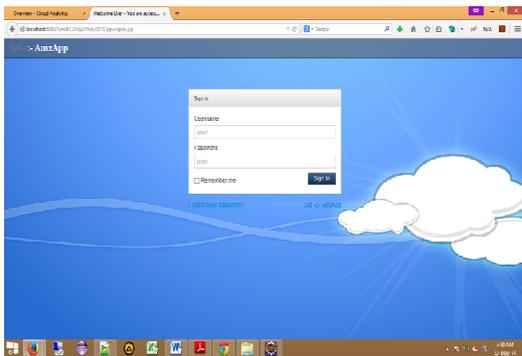
V. RESULT

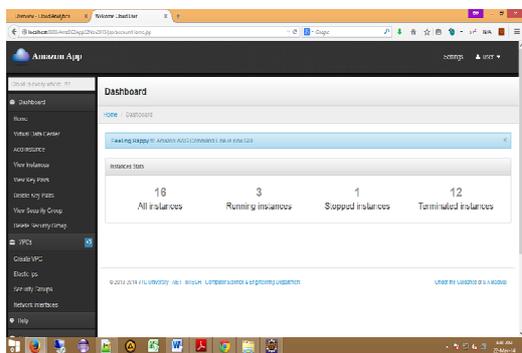
Figure 2: Deployment of nodes.
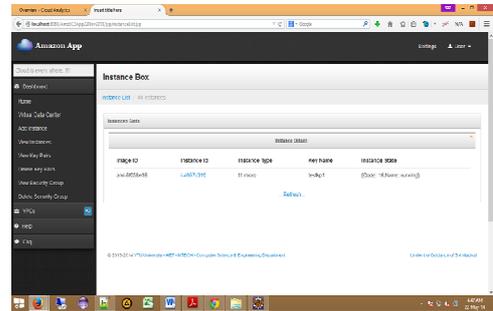

Figure 3: Virtual Machine Dashboard.

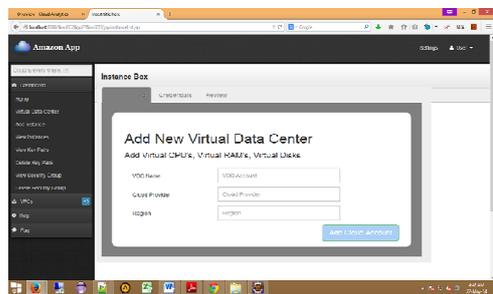Figure 4: Virtual Machine Properties.

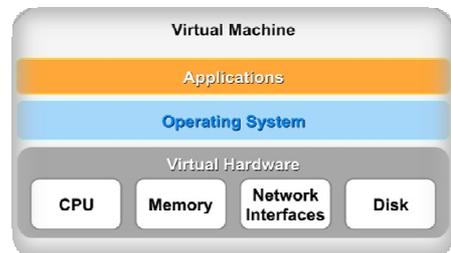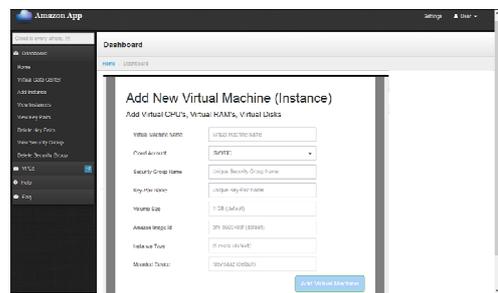Figure 5: Creation of Virtual Data Center

Figure 6: Virtual Machine deployment Structure.

Figure 7: Virtual Machine Creation.

Figure 8: Virtual Machine Provision.

Figure 8: Managing Virtual Instances.

Figure 9: Properties of Instances.

VI. CONCLUSION

Here we have tried to create a platform where Cloud Users can register to our application and get started with their instance management within no time. Our application allows users to set up the cloud environment within minutes of time. The Cloud Setup doesn't take time more than 15 minutes as tested. After the Creation of VM we even have tested and tried for hosting web application and running it live.

Life is easy as we create innovations to make tangible things smooth. In our application currently cloud User as a capability to register with Amazon Cloud.

Further enhancements to this application can be made by adding different cloud providers. Further also different other functionalities and services can be added as a future Scope of this project.

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