Development of Private Cloud

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Abstract- Cloud computing is a major change, caused by the underlying commoditization of IT. It is expected to see a future dominance of the open source model in cloud computing, which will solve the major adoption concerns for users. Even a small private cloud built on our college intranet gives us an idea of the dominance of cloud computing in near future. The scope of the cloud built in is scalable, allocate more capacity only when you need it, allocate more instances only when you need them, dynamic Instance Creation and Termination upon receiving a request.

Cloud computing Services-A comparison Recognized as one of the Top 10 technologies of 2010 by Gartner, Cloud computing has generated a lot of interest and competition in the industry. With the emergence of new cloud Providers, identifying one that best suits the business needs of an enterprise is a challenging and difficult task. Adopting a cloud Provider requires a detailed study of parameters like data security, SLA's and options that address the reduction of capital expenditure.

In this paper, we are carries out a high level comparison of the significant features delivered by key public cloud providers of the industry and key considerations that enterprises need to take into account while they embark on Cloud computing. Setting up of Private Cloud to provide IaaS (Providing an Operating System to the user) And SaaS Services (Web Applications).

Index Terms- Cloud computing, Private cloud, Services

I. INTRODUCTION

Cloud Computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g. storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. Cloud computing providers deliver applications via the internet, which are accessed from a Web browser, while the business software and data are stored on servers at a remote location

II. EXISTING SYSTEM

Cloud Computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g. storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. Cloud computing providers deliver applications via the internet, which are accessed from a Web browser, while the business software and data are stored on servers at a remote location

The drawbacks of non-cloud computing based systems

In the past, computing tasks such as word processing were not possible without the installation of application software on a user's computer. A user bought a license for each application from a software vendor and obtained the right to install the application on one computer system. With the development of local area networks (LAN) and more networking capabilities, the client-server model of computing was born, where server computers with enhanced capabilities and large storage devices could be used to host application services and data for a large workgroup. Typically, in client-server computing, a network-friendly client version of the application was required on client computers which utilized the client system's memory and CPU for processing, even though resultant application data files (such as word processing documents) were stored centrally on the data servers. Multiple user licenses of an application were purchased for use by many users on a network.

Advantages of cloud computing systems

Cloud computing differs from the classic client-server model by providing applications from a server that are executed and managed by a client's web browser, with no installed client version of an application required. Centralization gives cloud service providers complete control over the versions of the browser-based applications provided to clients, which removes the need for version upgrades or license management on individual client computing devices. The phrase "software as a service" (SaaS) is sometimes used to describe application programs offered through cloud computing. A common shorthand for a provided cloud computing service (or even an aggregation of all existing cloud services) is "The Cloud".

Characteristics of cloud

- Agility:- improves with users' ability to re-provision technological infrastructure resources.
- Cost is claimed to be reduced and in a public cloud delivery model capital expenditure is converted to operational expenditure.
- Device and location independent.
- Scalability.
- Performance monitoring.
- Maintenance of cloud applications is easier.

Types of Cloud Services

PaaS:- Platform as a service .Deliver computing platform and solution stack as a service.

SaaS :- Software as s service.

IaaS :- Infrastructure as a service .Delivers computer infrastructure –typically a platform virtualization environment as a service along with raw block storage and networking.

HaaS :- Hardware as a service. It's a procurement process similar to licensing. Generally speaking, a managed service provider remotely monitors and administers hardware on a client's site on a subscription basis.

Cloud Computing Components

Cloud Controller:- Eucalyptus component that provides the web UI (an https server on port 8443), and implements the Amazon EC2 API. There should be only one Cloud Controller in an installation of UEC. This service is provided by the Ubuntu eucalyptus-cloud package.

Cluster Controller:- Eucalyptus component that manages collections of node resources. This service is provided by the Ubuntu eucalyptus-cc package.

Node Controller:- Eucalyptus component that runs on nodes which host the virtual machines that comprise the cloud. This service is provided by the Ubuntu package eucalyptus-nc.

Storage Controller:- Eucalyptus component that manages dynamic block storage services (EBS). Each 'cluster' in a Eucalyptus installation can have its own Storage Controller. This component is provided by the eucalyptus-sc package.

Walrus Controller-Eucalyptus component that implements the Amazon S3 API, used for storing VM images and user storage using S3 bucket put/get abstractions.

III. PROPOSED SYSTEM

The existing systems specified earlier in the synopsis are all public clouds that are deployed on the internet and are geographically located far away. These systems provide transparency to the users that access the services via the World Wide Web. Whereas, the system proposed in our project is a private cloud, which is deployed on the intranet of our college. This cloud will enable the users to access resources and applications on the cloud, built on the systems of the college itself. This cloud would be accessible only from a system on the college intranet and not via the World Wide Web.

The volumes attached to the user instance would be independent of the instance which the user is running. Each user has got his/her own volume (storage space) which can be attached to any of the instances launched by the user.

The system will constantly monitor the load on the Node Controllers and automatically perform appropriate tasks of Creation or Termination of Instances on the node.

The system starts the Node Controller if the load exceeds a certain specified threshold (Threshold is assumed at 80%) and shuts down a running Node Controller if the load is below the specified threshold for certain predetermined period of time.

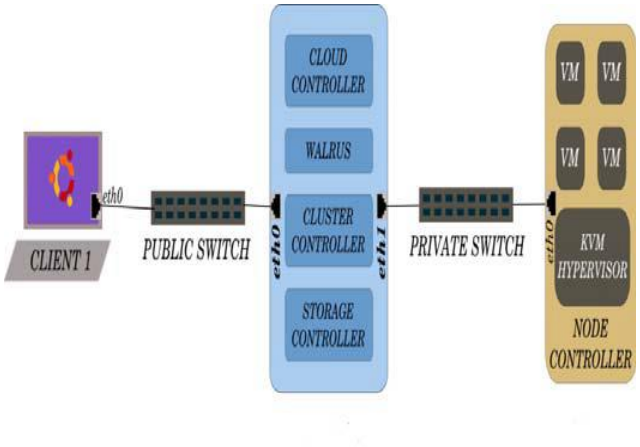


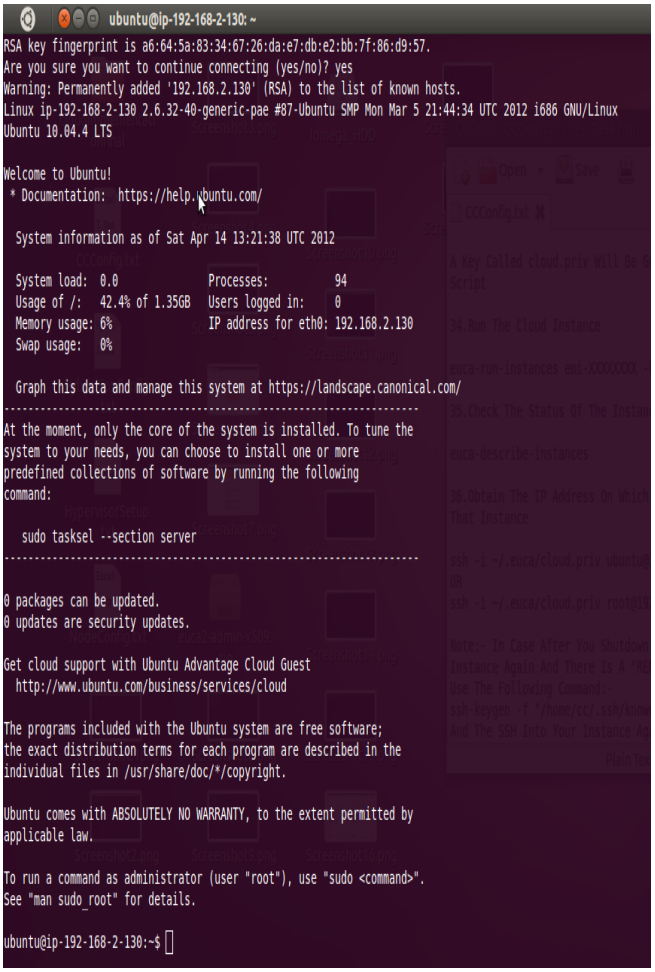
Fig no 5: Building A Private Cloud

IV. MAIN ALGORITHM

The main algorithm of the project is the implementation algorithm for configuring the cloud.

1. Configuration of Interfaces on the Cloud Controller
2. Restarting the Network Services on the Cloud Controller
3. Install the Hypervisor (KVM OR XEN)
4. Create a Virtual Hard Drive
5. Install preferably a Server Operating System on that Virtual Machine
6. Configuration of Interfaces on the Node Controller
7. Restarting the Network Services on the Node Controller
8. Update and install respective Eucalyptus Services on both the Controllers
9. Synchronize the Cloud and the Node Controllers
10. Disable the Firewalls
11. Bridge the Connectivity Ports
12. Check status for each component (both on CC and NC)
13. Register Services on the Cloud Controller
14. Download Credentials from the Localhost on the Cloud
15. Alter the Virtualized Component Specifications
16. Bundle the Images
17. Launch the Instances
18. For providing security use –SSH command
19. To run and manage the resources use hybrid firefox.
20. Check for EKI,ERI.EMI files on hybrid firefox

Once all above steps implemented just download credentials on node and access the file



This figure shows A development of IAAS service ie. Image is deployed on the node after implementing all the above steps which are shown in algorithm after that on node run the word Processor software which is implemented in PHP.

Programming Languages Used For Implementation Of Saas Service

The following programming languages were used for implementation:

- HTML

Used for developing interface of the Word processor

- Mysql

Used for creation and management of Databases

- PHP

Used for uploading and downloading of user documents by using above languages we are creating word processor application we are develop one application and on node we are just passing our application and user can access it through the node and data is stored at cloud controller

Tools Used For Implementation Of Iaas Services

The following tools were used for implementation:

- Ubuntu Desktop 12.10-Operating System
- Eucalyptus-Private Cloud Software
- SSH Server-Secure Shell (remotely executing commands)
- Shell Script-Executable Code (.sh files)

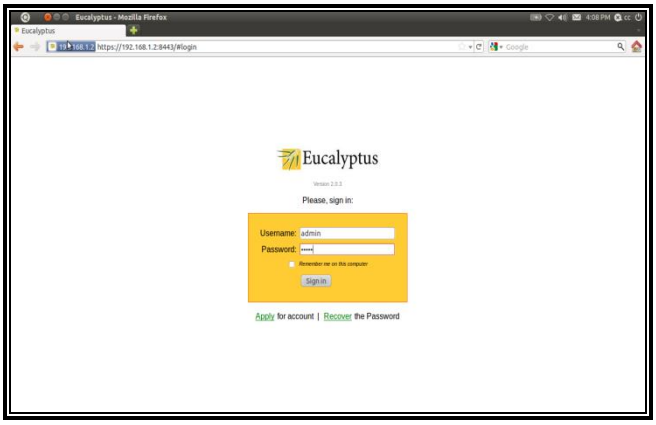
The following tasks can be performed and can enhance the performance of the cloud.

- Automatically turning node controllers on/off:-Now as we can switch off the idle nodes from the cloud controller, we have to sense the load from the nodes and then comparing with the Threshold set, turn them off. Also when a fresh load arises and if there are no free nodes to handle it, we have to automatically switch on the idle nodes again from the cloud controller.
- Dynamic Instance Creation and Termination:-If the number of requests for a particular service increases the threshold the nodes can serve, then dynamically launching the new Instance of that service. And if no users are using that service, then dynamically terminating that instance.
- More Applications can be provided on the cloud For Example: - Image Processing Services, video compression, Document format converters.
- Develop a Word Processor application: Develop a Word Processor application in php and retrieve the data and show it in database

V. RESULTS

Download Credentials

a)Go To: https://192.168.1.2:8443/
Login:
Username:admin
Password:admin
b)Enter New Password As admin And Enter Administrators E-Mail Address
c)Click On Credentials Tab.Click On Download Credentials Button
d)Save The File To The Desktop



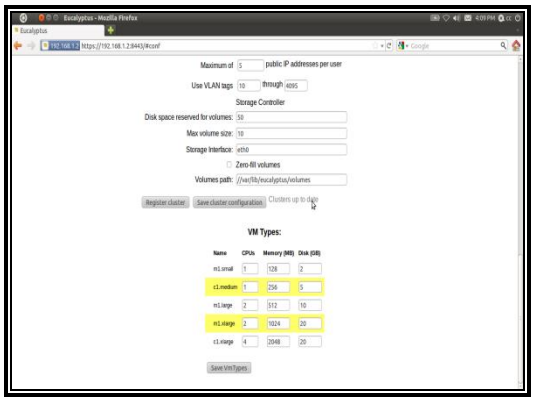


Figure No 8: Registering The Cloud

Figure No 9:- Run System Monitor On Cloud Controller:

Figure No 10:- Run System Monitor On Node Controller:

Performance Enhancements

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VI. CONCLUSION

Cloud computing is the next big wave in computing. It has many benefits, such as better hardware management, since all the computers are the same and run the same hardware. It also provides for better and easier management of data security, since all the data is located on a central server, so administrators can control who has and doesn't have access to the files. There are some down sides as well to cloud computing. Peripherals such as printers or scanners might have issues dealing with the fact that there is no hard drive attached to the physical, local machine. If there are machines a user uses at work that aren't their own for any reason, that require access to particular drivers or programs, it is still a struggle to get this application to know that it should be available to the user.

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