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A Survey on Cloud Computing Virtual Solutions

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Abstract:Cloud computing is an attractive computing model as it is ubiquitous and easily scalable. Resources can be provided on request or borrowed whenever needed. This motivated institutions to develop open source cloud solutions. Companies place their applications and data on cloud. This paper describes the current state of open source cloud computing solutions. These solutions are described and classified to leverage the cloud computing research area. It provides a starting point for tackling some of the problems that occur in cloud computing environments.

Keywords: Cloud Computing, open source cloud computing solutions, Cloud Applications

1. INTRODUCTION

Earlier, Enterprise and companies used to host the data on its internal servers, which had various drawbacks like, No Proper backups, even if there were backups, data after a certain save point was lost in case of system failure which incurred a lot of repeated work to be done. Also, the companies needed multiple servers to keep data secure in case of data lost due to failure of a single server, which needs a lot of money to be involved into data security. The interconnections were done with the help of LANs, WANs & PANs. The power of the servers had to be always kept on for usage.

With the evolution of Cloud Computing Solutions that had a lot of servers and shared storage resources, humongous amounts of data can be stored at such a low cost, which not only saves resources but also time and energy. The Applications & data can be accessed anytime from any corner of the world with just the availability of internet services. Data security is increased due to incorporation of multiple servers on a single platform. Here, we do a study of Various Cloud Computing Solutions.

2. OPEN-SOURCE SOLUTIONS FOR CLOUD COMPUTING

Due to the rapid growth of cloud computing, there are several solutions in this area. This article focuses on open source solutions and explains its main functions.

Existing Architecture:

2.1. Xen Cloud Platform (XCP)

- The Xen hypervisor is a solution for infrastructure virtualization.
- Allows to run Virtual servers.
- Handles the OS and its applications from underlying physical server.
- This provides an abstraction level between the server hardware and the operating system.
- With the Xen hypervisor, each physical server can run multiple virtual servers.
- Do not provide the overall architecture for Cloud services.

• Used by Amazon EC2, Nimbus, Eucalyptus etc.



Figure 1. XCP Architecture

2.2. Nimbus

- Nimbus is an open source solution (licensed under the terms of Apache License) convert Cluster to Infrastructure as Service for Cloud (IaaS).
- It focuses on scientific applications.
- 'Cloudbit Configuration' consists- Manager service hosting & Image Repository
- Nimbus currently supports two front ends, Amazon EC 2 and WSRF.



Figure 2. Nimbus Workspace Components

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2.3. Open Nebula

- It is an open source toolkit for creating private, public cloud and hybrid cloud.
- Designed to be integrated with networking and storage solutions.
- Fit into existing data centres.
- Architecture based on:
 - Virtualization
 - ➢ Storage
 - > Network



Figure 3. Open Nebula Architecture

2.4 Eucalyptus

- Open source cloud computing.
- Provides resources for experimental tools and research.
- Focused on Academic Research.
- Dedicated resource is not required.
- Encourages 3rd party extensions.
- Based on Amazon EC2.
- Supports VMs that run on top of Xen Supervisor.
- Allows Clusters to be a part of same local network



Figure 4. Eucalyptus Architecture

2.5. TPlatform

- It acts as a PaaS
- Provides a development platform for Web Mining Applications.
 - Supported by 3 Technologies:
 - Scalable File System
 - Big Data table
 - Map Reduce programming model



Figure 5. TPlatform Framework

2.6. Apache Virtual Computing Lab (VCL)

Acts as a SaaS

• Provides remote access over the internet.

- Components of Architecture:
 - ➢ Web Server
 - Database Server
 - Management Nodes

2.7. Abnormal Elastic Computing Platform

• Virtual Machine administration in small Cloud environments.

- Limitation:
 - ► Limited Scalability
 - ➢ No Capacity control mechanism

➢ No support for Accounting & Metering

3. RESULT:

Platfor m Param eter	X C P	Ni mb us	Op en Ne bul a	Eucal yptus	TPla tfor m	Ap ach e VC L	Eno mol y
Virtua lizatio n	Y es	Yes	Yes	No	No	No	No
Acade mic Resear ch	N o	No	No	Yes	No	No	No
Web Minin g	N o	No	No	No	Yes	No	No
XEN Hyper	-	Yes	Yes	Yes	No	No	No

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visor							
Uses/U sed by Amazo n EC2	Y es	Yes	No	Yes	No	No	No
Shared Storag e	Y es	Yes	-	Yes	-	-	-
Amazo n based Fronte nd	-	Yes	_	Yes	-	_	-
Fault Tolera nce	-	Yes	Yes	Yes	-	-	-
Operat es with XEN Hyper visor	-	Yes	-	_	_	-	Yes
SaaS						Yes	
PaaS					Yes		
IaaS	Y es	Yes	Yes	Yes			Yes
Securit y	-	Yes	Yes	Yes	-	-	-
Web Manag ement	Y es	Yes	Yes	Yes	Yes	Yes	Yes
Physic al Host Manag ement	Y es	Yes	Yes	Yes	Yes	Yes	Yes

Table 1. Comparison between Cloud Computing Virtual Solutions

4. CONCLUSIONS AND FUTURE WORKS:

It is concluded that there is need to standardize the present cloud computing platforms in terms of interface, negotiation and access through web services. The Xen Hypervisor is a solution for Infrastructure virtualization. Nimbus focuses on scientific applications whereas Eucalyptus on academic research. TPlatfrom provides a developing platform for Web Mining applications. Apache Virtual Computer Lab provides remote access over internet & Open Nebula is designed to be integrated with networking and storage solutions. Nimbus also implements multiple front ends to ensure a varied access to its existing users. As future work, performance evaluation measurements should be used to quantitively compare the already present solutions.

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