International Journal of Current Engineering and Technology
E-ISSN 2277 – 4106, P-ISSN 2347 – 5161

Available at http://inpressco.com/category/ijcet

Research Article

Several Cloud Computing Forum

Mahak*

#Department of CSE, Kurukshetra University Kurukshetra, India

Accepted 12 April 2017, Available online 28 April 2017, **Vol.7, No.2 (April 2017)**

Abstract

With the development of parallel computing, distributed computing, grid computing, a new computing model appeared, called cloud computing. The basic principles of cloud computing is to make the computing be assigned in a great number of distributed computers, rather then local computer or remoter server. Now many corporations have involved in the cloud computing related techniques and many cloud computing platforms have been put forward. In this paper analyzed and comparison of various open source cloud platforms and comparison of various cloud platforms with implementation aspects. From the comparison of these platforms, users can better understand the different cloud platforms and more reasonability choose what they want.

Keywords: *Cloud Computing, Cloud Platforms, Virtualization, IaaS, PaaS, SaaS.*

1. Introduction

Cloud computing is set of resources and services offered through the Internet. Cloud services are delivered from data centers located throughout the world. With the rapid development of the Internet, Cloud computing enables users to access resources online through the internet, from anywhere at any time without worrying about technical/physical management and maintenance issues of the original resources. Its foreground is to provide secure, quick, convenient data storage and net computing service centered by internet. The factors that drive the occurring and development of cloud computing include: the development of grid computing, the appearance of high quality technology in storage and data transportation, and the appearance of Web2.0, especially the development of Virtualization (Shuai Zhang *et al*, 2010)

The rest of this paper is organized as follows: Section 2 describes the definition and services of cloud computing. In Section 3 takes comparison of open source cloud platforms. In section 4 discusses comparison of cloud platform as a service (PAAS), Comparison of cloud platforms with implementation aspects in Section 5 and finally, Section 6 concludes the paper.

2. Cloud computing

A number of computing researchers and practitioners have attempted to define Clouds in various ways . Based the observation of the essence of what Clouds are promising to be, this paper follows the definition of cloud computing proposed in (R Buyya *et al*)

A Cloud is a type of parallel and distributed system consisting of a collection of inter-connected and virtualized computers that are dynamically provisioned and presented as one or more unified computing resources based on service-level agreements established through negotiation between the service provider and consumers.

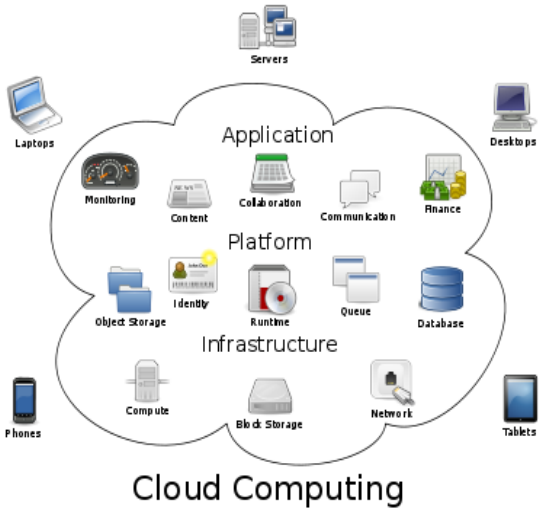

Fig. 1 Cloud Computing

Cloud computing provides three service models that provide different levels of control and security (Junjie Peng *et al*). These levels are, in decreasing order of control and increasing order of security:

*Corresponding author is a PhD Scholar

Software as a Service (SaaS): Software's are provided as a service to the consumers according to their requirement, enables consumers to use the services that are hosted on the cloud server.

Platform as a Service (PaaS): Clients are provided platforms access, which enables them to put their own customized software's and other applications on the clouds.

Infrastructure as a Service (IaaS): Rent processing, storage, network capacity, and other basic computing resources are granted, enables consumers to manage the operating systems, applications, storage, and network connectivity.

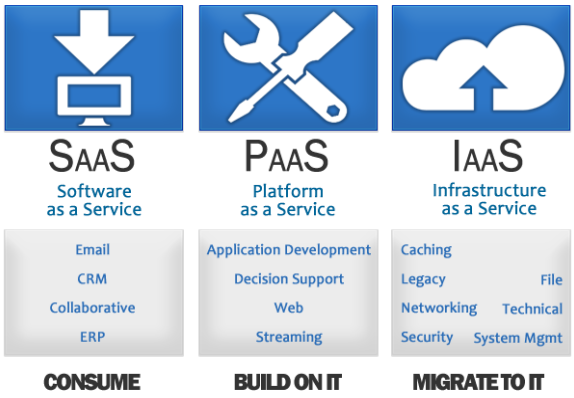

Fig.2 Services provided by cloud computing

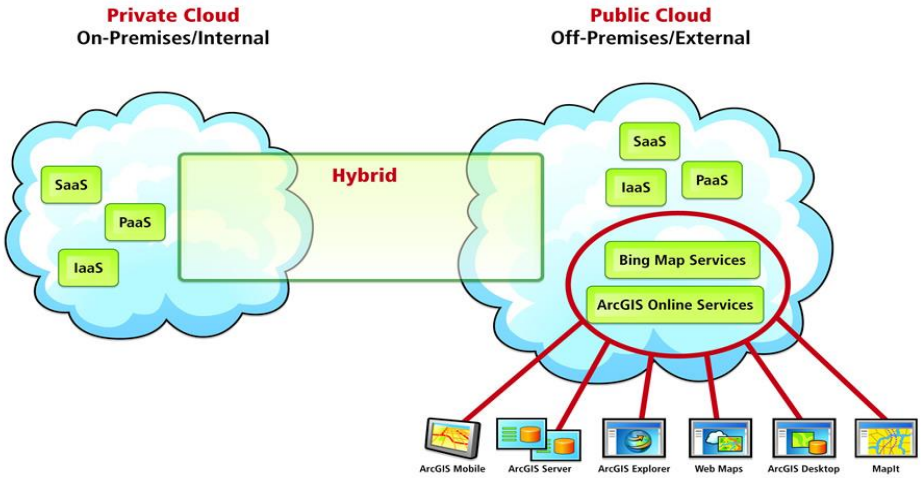

Fig. 3 Types of cloud computing platforms

To all these services, there is no need for users to manage or control the cloud infrastructure, including network, server, operating system, storage and even the functions of applications.

From the point of deployment, cloud computing platform include three kinds (Junjie Peng *et al*)

Private Cloud: It means the cloud infrastructure is owned or leased by only one organization, and of course management of the infrastructure is also done by the same organization.

Public Cloud: It means that the cloud infrastructure is owned by a cloud service sales organization who tries to sell cloud computing services to the public or industry circle.

Hybrid Cloud: It means that the cloud infrastructure consists of more than two kind of cloud say private cloud and public cloud in which each kind of cloud keep independent, however they are combined with some standards or special techniques and data and applications are transplant (K Keahey *et al*)

There are many cloud platforms, each has its own characteristics and advantages and how to make a reasonable choice is a big issue. To this problem, A detailed comparison of several popular cloud platforms are presented in this paper. From the analysis and comparison, users will be more clear to make their decisions to choose appropriate cloud platforms

3. Comparison of open source cloud

In this section analysis and comparison of some open source cloud platforms.. Current Cloud is focusing on the issue of interoperability which is essential for enterprise cloud system. Most of the open source clouds are provided IaaS (Newsher Khan *et al*) The comparison of open source cloud platforms are shown in Table 1.

Table 1: Comparison of open-source cloud platforms

	Abicloud	**Eucalyptus**	**Nimbus**	**OpenNebula**
Developer	Abiquo	Eucalyptus System, Inc	Kate Keahey, Tim Freeman	OpenNebula Community
Computing Architecture	• Distinctive web-based management functions.	• Ability to configure multiple clusters, each with private internal network addresses, into a single cloud. • Private Cloud.	• Science cloud. • Client-Side cloud-computing interface to Globus-enabled TeraPort cluster. • Nimbus Context Broker that combines several deployed virtual machines into turnkey virtual clusters. • Heterogeneous clusters of auto-configuring VMs with one command.	• Cluster into an IaaS cloud. • Focused on the efficient, dynamic and scalable management of VMs within datacenters (private cloud) involving a large amount of virtual and physical servers. • Based on Haizea scheduling.
Service	IaaS	IaaS	IaaS	IaaS
Virtualization Management	Xen Virtualization	Hepervisors (Xen, KVM, VMWare)	Xen Virtualization	Xen KVM and on-demand access to Amazon EC2
Interoperability	Standard-based architecture: Allows connection to products and third-party systems	Multiple cloud computing interfaces using the same back-end infrastructure	Standards : rough consensus and working code	Interoperable between intra cloud services
Security	CAS (Code Access System)	WS-security for authentication, cloud controller generates the public/private key.	• PKI credential required. • Works with Grid proxies VOMS, Shibboleth (via GridShip), custom PDPs.	Firewall, Virtual Private Network Tunnel.
Fault Tolerance	No additional data backup	Separate cluster within the Eucalyptus cloud reduce the chance of correlated failure	Checking worker nodes periodically and recovery	• The daemon can be restarted &all running VMs recovered. • Persistent database backend to store host and VM information.

Table 2:Comparison of Some Cloud Computing Platforms as a service

Developer	**Amazon**	**Microsoft**	**Google**	**Sun Microsystem (Network.com)**	**GRIDS Lab**
Cloud	Elastic Compute Cloud (EC2)	Azure	App Engine	Sun Grid	Aneka
Focus	Infrastructure	Platform	Platform	Infra-structure	Enterprise clouds
Service Type	Compute, Storage (Amazon S3)	Web and non-web application	Web Application	Computing	Computing
Value-added service providers	Yes	Yes	No	Yes	No
User Access interface	Amazon EC2 command-line tools	Microsoft windows azure portal	Web-based administration	scripts, Sun Grid web portal	Work-bench, web-based portal
Virtualization	OS level running on a Xen hypervisor.	OS level through fabric controller	Application container	Job management system (Sun Grid Engine)	Resource manager and scheduler
Web APIs	Yes	Yes	Yes	Yes	Yes
Dynamic negotiation of QoS	None	None	None	None	SLA-base resources reservation
Programming Frame-work	Amazon Machine Images (AMI)	Microsoft.NET	Python	Solaris OS. Java, C, C++, FORTRAN	APIs supporting models in c# .Net

4. Comparison of cloud platform as a service

The comparative study of various cloud platforms: each one has its own characteristics and advantages. For better understanding, we analyze these platforms and give comparison of cloud platforms as a service (Nnewsher Khan *et al*). As shown in Table 2.

Table 3: Comparison of cloud platforms with implementation aspects

	Abicloud	**Eucalyptus**	**Nimbus**	**OpenNebula**
Cloud Character	Public/Private	Public	Public	Private
Scalability	Scalable	Scalable	Scalable	Dynamical, Scalable
Cloud Form	IaaS	IaaS	IaaS	IaaS
Compatibility	Not support EC2	Support EC2, S3	Support EC2	Open, Multiplatform
Deployment	Pack and Redeploy	Dynamical Deployment	Dynamical Deployment	Dynamical Deployment
Deployment Manner	Web Interface Drag	Command Line	Command Line	Command Line
Transplant Ability	Easy	Common	Common	Common
VM Support	VirtualBox, Xen, VMware,VM	VMWare, Xen, KVM	Xen	Xen, VMWare
Web Interface	Libvirt	Web Service	EC2 WSDL, WSRF	Libvirt**,** EC2, OCCI API
Structure	Open Platform Encapsulate Core	Module	Lightweight Components	Module
Reliability	-	-	-	Rollback Host and VM
OS Support	Linux	Linux	Linux	Linux
Development Language	Ruby, C++, python	Java	Java, Python	Java, Ruby

5. Comparison of cloud platforms with implementation aspects

There are different kinds of cloud platforms- Abicloud, Eucalyptus, Nimbus and OpenNebul(Newsher Khan etar). Each one has its own characteristics and advantages. For better understanding, here analyze and give with detail comparison from different implementation aspects. As shown in Table 3.

Conclusion

Cloud computing is a new technology widely studied in recent years. There are so many cloud platforms both in industry and in academic field. This paper presents a comprehensive comparison of different aspects of cloud's platforms. In analysis of these various open-source cloud computing frameworks, we found that there are salient philosophical differences between them regarding the overall scheme of their design. After this analysis, user can well know to choose the appropriate cloud platforms according to requirement like the cloud types, interfaces, compatibility, implementation, deployment requirement, and development support and so on.

References

Wikipedia tutorials on Cloud computing [Online]. Available: http://en.wikipedia.org/wiki/Cloud_computing.

http://cloudcomputing.syscon. Com website on twenty Experts Define Cloud Computing, [Online], Available: http://cloudcomputing.syscon. com/read/612375_p.htm.

R.Buyya, C.S.Yeo, S.Venugopal. Market-Oriented Cloud Computing:Vison, Hype, and Reality for Delivering IT Services as Computing Utilites, The 10th IEEE International Conference on High Performance Computing and Communications.

K. Keahey and T. Freeman, Science Clouds: Early Experiences in Cloud Computing for Scientific Applications, in proceedings of Cloud Computing and Its Applications 2008, Chicago, IL. 2008.

B. Sotomayor; K. Keahey, I. Foster(March 2008). Combining Batch execution and Leasing Using Virtual Machines, HPDC 2008, Boston, pp 1-9.

Junjie Peng; Xuejun Zhang; Zhou Lei, Bofeng Zhang, Wu Zhang; Qing Li,(2009) Comparison of Several Cloud Computing Platforms, IEEE Second International Symposium on Information Science and Engineering

Nawsher Khan*; A. Noraziah, Elrasheed I. Ismail, Cloud Computing: Analysis of Various Platforms.

Nawsher Khan; A.Noraziah, Mustafa Mat Deris, 2011; Elrasheed I.Ismail, Cloud Computing: Comparison of Various Features, Springer, International Conference on Digital Enterprise and Information Systems, DEIS , CCIS 194, pp. 243–254.

Shuai Zhang ; Shufen Zhang;, Xuebin Chen ; Xiuzhen Huo (Nov 2010), Cloud Computing Research and Development Trend, Second International Conference on Future Networks.pp-456-457.