IJISET - International Journal of Innovative Science, Engineering & Technology, Vol. 2 Issue 2,February 2015.
www.ijiset.com
ISSN 2348 – 7968

A Review on Cloud Computing and Grid Computing

[1]N J Pramod Dhinakar [2]M Suleman Basha [3]S Rahamat Basha

Asst. Professor, Dept of IT
RGMCET, Nandyal

ABSTRACT

Cloud computing recognized as one of the newest topic in field of information technology. Cloud computing is foundation of numerous computing research areas such as HPC, virtualization, utility computing and grid computing. Grid computing is a structure of distributed computing that inhabit organize and sharing computing, application, data and storage or network resources athwart dynamic and geographically detached organization. In this paper we discussed cloud computing deployment models and service models. And grid computing characteristics are to be illustrated. This paper resists comparing and contrasting cloud computing with grid computing from various viewpoints.

Keywords: *cloud computing; grid computing; comparison*

1. INTRODUCTION

Cloud computing [2] is TCP/IP based high development and integrations of computer technologies such as fast micro processor, huge memory, high-speed network and consistent system architecture. Without the typical inter-connect protocols and adult of assembling data center technologies, cloud computing [2] would not become authenticity too. In October 2007, IBM and Google [1] broadcast collaboration in cloud computing.

The term “cloud computing” become admired from then on. Beside the web email, the Amazon Elastic Compute Cloud (EC2), Google App Engine and Sales force’s CRM mainly represent a promising intangible foundation of cloud services. The services of cloud computing is mostly divided into three categories: Infrastructure-as-a-Service (IaaS), Platforms- a-Service (PaaS), and Software-as-a-Service (SaaS). Cloud computing also is alienated into five layers counting clients, applications, platform, communications and servers. The five layers look like more sensible and clearer than the three categories. There are more than 20 definitions [3] of cloud computing that appear to only focus on convinced aspects of this technology. Mixed machine heterogeneous computing (HC) environments make use of a disseminated suite of dissimilar machines, consistent with computer network.

To achieve dissimilar computationally concentrated applications that has assorted requirements. Various resources should be orchestrated to perform a number of farm duties in equivalent or to solve composite tasks atomized to variety of self-governing subtasks. Grid computing is a capable technology for future computing platforms and is predictable to provide easier access to remote computational resources that are usually locally limited. According to Foster in, grid computing is hardware and software communications which offer a cheap, distributable, synchronized and dependable access to powerful computational capabilities. The purpose of this paper is to distinguish and present a side by side evaluation of grid and cloud computing and present what open areas of research exist. We illustrate the concept of cloud computing and grid computing and compare them.

2. CLOUD COMPUTING

Nowadays, nearly everybody, every IT company is converse the cloud. Though there is no accurate description about cloud computing, you can recognize it in many ways. Cloud computing is a model for facilitate omnipresent, suitable, on-demand network access to a collective pool of configurable computing resources that can be quickly provisioned and released with nominal management endeavor or service contributor interface. The United States government is a major customer of computer services and, therefore, one of the main users of cloud computing networks. The U.S. National Institute of Standards and Technology [6] (NIST) have a set of working definitions that divide cloud computing into service models and deployment models. Those models and their affiliation to essential characteristics of cloud computing are shown in Figure 1.

2.1 Deployment Models

A deployment model describes the purpose of the cloud and the nature of how the cloud is positioned. The NIST [6] definition for the four deployment models is as follows:

• ***Public cloud:*** The public cloud communications is obtainable for public use otherwise for a large industry group and is owned by an association promotion of cloud services.

• ***Private cloud:*** The private cloud infrastructure is function for the restricted use of an organization. The cloud may be managed by that organization or a third party.

• ***Hybrid cloud:*** A hybrid cloud combines multiple clouds (private, community of public) where those clouds preserve their exclusive identities, but are bound together as a unit. A hybrid cloud may offer homogeneous or proprietary access to data and applications, as well as application portability.

• ***Community cloud:*** A community cloud is one where the cloud has been prearranged to serve a common function or principle. It may be for one association or for several organizations, but they contribute to common concerns such as their mission, policies, security, regulatory compliance needs, and so on. A community cloud may be managed by the ingredient organization(s) or by a third party.

2.2 Service Models

Infrastructure-as-a-Service is the liberation of huge computing resources such as the capability of processing, storage and network. Taking storage as an example, when a user use the storage service of cloud computing he just pays the overriding part without buying any disks or even significant nothing about the location of the data he deals with. Sometimes the IaaS is also called Hardware-as-a-Service (HaaS).

Platform-as-a-Service normally abstracts the infrastructures and supports a set of application program interface to cloud applications. It is the center bridge between hardware and application. Because of the consequence of platform, many big companies want to grasp the chance of pre-dominating the platform of cloud computing as Microsoft does in personal computer time. The well known examples are Google App Engine and Microsoft's Azure Services Platform.

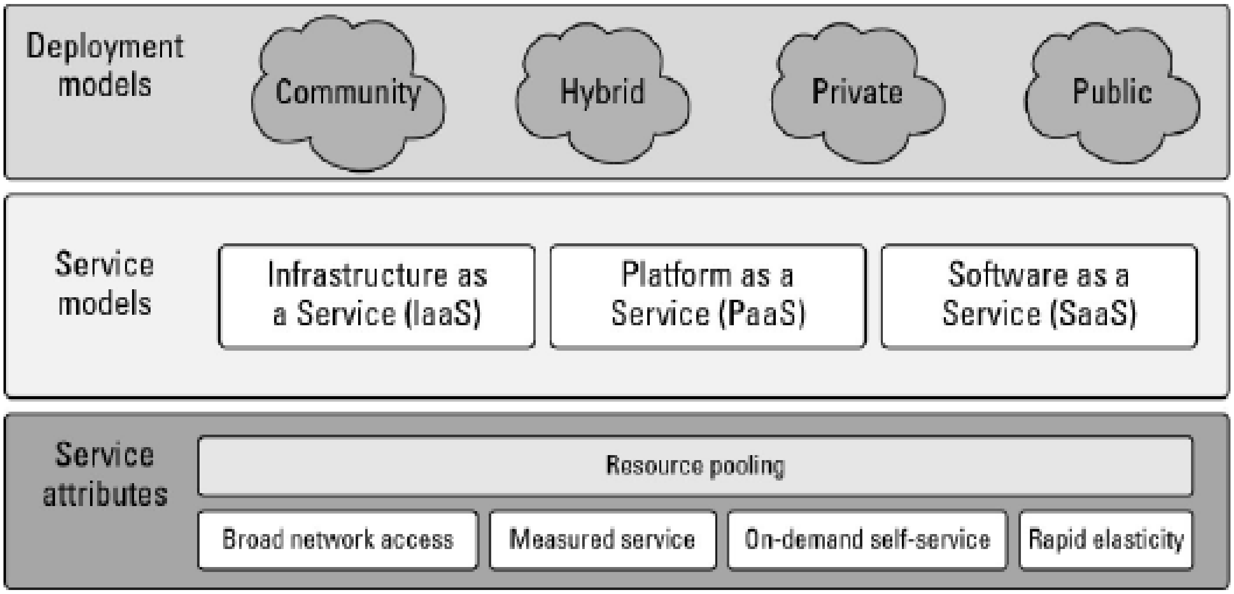

Figure 1: The NIST cloud computing definitions

It is the center bridge between hardware and application. Because of the consequence of platform, many big companies want to grasp the chance of pre-dominating the platform of cloud computing as Microsoft does in personal computer time. The well known examples are Google [1] App Engine and Microsoft's Azure Services Platform.

Software-as-a-Service aims at replacing the applications running on PC. There is no need to install and run the special software on your computer if you use the SaaS. As an alternative of export the software at a comparative higher price, you just follow the pay-per-use prototype which can reduce you total cost. The concept of SaaS is striking and some software runs well as cloud computing, but the delay of network is incurable to real time or half real time applications such as 3D online game.

3. GRID COMPUTING

Grid computing [7] is a form of distributed computing that occupies organized and sharing

Computing, application, data and storage or network resources athwart dynamic and geographically detached organization.

A grid technology [5] assures to change the way organizations equipment composite computational problems. The vision of grid computing [8] was to permit access to computer based resources in the same approach as real world utilities. This gave increase to the idea of Virtual Organizations (VOs). Through the formation of VOs, it was probable to access all resources as though all resources were owned by a single organization.

Two key conclusions exist in grids: the Open Grid Service Architecture (OGSA) and the Globus Toolkit [9] [10].

3.1 Grid Characteristics

These characteristics may be illustrated as follows:

Large scale: a grid must be capable to deal with a number of resources assortments from just a few to millions. This raises the very serious problem of avoiding potential presentation degradation as the grid size increases.

Geographical distribution: grid's resources may be located at distant places.

Heterogeneity: a grid hosts both software and hardware resources that can be very varied ranging from data, files, software components or programs to sensors, scientific instruments, display devices, personal digital organizers, computers, super-computers and networks.

Resource sharing: resources in a grid belong to many different organizations that allow other organizations (i.e. users) to access them. Nonlocal resources can thus be used by applications, promoting efficiency and reducing costs.

Multiple administrations: each organization may establish different security and administrative policies under which their owned resources can be accessed and used. As a result, the already challenging network security problem is complicated even more with the need of taking into account all different policies.

Resource coordination: resources in a grid must be coordinated in order to provide aggregated computing capabilities.

Transparent access: a grid should be seen as a single virtual computer.

Dependable access: a grid must assure the delivery of services under established Quality of Service (QoS) requirements. The need for dependable service is fundamental since users require assurances that they will receive predictable, sustained and often high levels of performance.

Consistent access: a grid must be built with standard services, protocols and inter-faces thus hiding the heterogeneity of the resources while allowing its scalability. Without such standards, application development and pervasive use would not be possible.

Pervasive access: the grid must grant access to available resources by adapting to a dynamic environment in which resource failure is commonplace. This does not imply that resources are everywhere or universally available but that the grid must tailor its behavior as to extract the maximum performance from the available resources.

4. COMPARISON

Vision in a broad sense, the concepts of grid and cloud computing [11] give the impression to have similar features. This section puts light to distinguish in dissimilar perceptions and give an end-to-end comparison. It could be understand easily when correspond to in a tabular form as given in **table 1**.

Several applications and tools in grid computing and cloud computing are epigrammatic here (see **table 2** and **table 3**) [11] [12].

Table 1: *GC Vs. CC*

Parameter	Grid computing	Cloud computing
Goal	mutual sharing of resources	Use of service
Computational focuses	Computationally concentrated Operations	Standard and high-level illustration
Workflow management	In one physical node	In EC2 instance
Level of abstraction	Low	High
Degree of scalability	Normal	High
Multitask	Yes	Yes
Transparency	Low	High
Requests type	Few but large distribution	Lots of small distribution
Allocation unit	Job or task	All shapes and sizes
Virtualization	Not a product	Vital
Portal accessible	Via a DNS system	Only using IP
Transmission	Suffered from internet delays	Was significantly fast
Security	Low	High
Operating System	Any standard OS	A hypervisor (VM) on which multiple OSs run
Ownership	Multiple	Single
Interconnection network	frequently internet with latency and low bandwidth	Dedicated, high-end with low latency and high bandwidth
Discovery	Centralized indexing and decentralized info services	Membership services
Service negotiation	SLA based	SLA based
User management	Decentralized and also Virtual Organization (VO)-based	Centralized or can be delegated to third party
Resource management	Distributed	Centralized/Distributed
User friendly	Low	High
Type of service	CPU, network, memory, bandwidth, device, storage.	IaaS, PaaS, SaaS, Everything as a service
Resource	Limited	Unlimited
Future	Cloud computing	Next generation of internet

Table 2: Grid and Cloud applications

Technology	Application	Comment
Grid	DDGrid (Drug Discovery Grid)	This project aims to construct an association proposal for drug discovery using the state-of-the-art P2P and grid computing technology.
	MammoGrid	It is a service-oriented construction based medical grid application.
	Geodise	Geodise aims to provide a Grid-based generic combination framework for computation and data concentrated multidisciplinary design optimization tasks.
Cloud	Cloudo	A free computer that lives on the Internet, right in the web browser.
	RoboEarth	Is a European project led by the Eindhoven University of Technology, Netherlands, to develop a WWW for robots, a giant database where robots can share information about objects?
	Panda Cloud antivirus	The first free antivirus from the cloud.

Table 3: Grid and Cloud tools

Technology	Tool	Comment
Grid	Nimrod-G	Uses the Globus [10] middleware services for dynamic resource discovery and dispatching jobs over computational grids.
	Gridbus	(GRID computing and BUSiness) toolkit [9] project is connected with the design and development of cluster and grid middleware technologies for service oriented computing
	Legion	Is an object-based meta-system that supports transparent core scheduling, data management, fault tolerance, site autonomy, and a middleware with a wide range of security options?
Cloud	Cloudera	An open-source Hadoop software framework is more and more used in cloud computing deployments due to its flexibility with cluster-based, data intensive queries and other tasks.
	CloudSim	Important for developers to estimate the requirements of large scale cloud applications.
	Zenoss	A single, included product that monitors the entire IT infrastructure, wherever it is deployed (physical, virtual, or in cloud).

5. CONCLUSION

In this paper, we have obtainable a comprehensive comparison on the two computing models, grid and cloud computing. We consider a close comparison such as this can help the two communities recognize, contribute and develop infrastructure and technology contained by and across, and accelerate Cloud Computing from early prototypes to manufacture systems. In this paper, we required to separate grids from clouds and afford a side by side evaluation in how they are assembled. Grid and cloud computing appears to be a promising model particularly focusing on standardizing APIs, security, interoperability, new business models, and self-motivated pricing systems for multifaceted services.

REFERENCES

[1].IBM, "Google and IBM Announced University Initiative to Address Internet-Scale Computing Challenges,"http://www03.ibm.com/press/us/en/press release/22414.wss

[2]."What is cloud computing?" http://searchcloudcomputing.techtarget.com/sDefini

[3].L.M. Vaquero, L.R. Merino, J. Caceres, and M. Lindner, "A break in the clouds: towards a cloud definition," ACM SIGCOMM Computer Communication Review, Vol. 39, No. 1, 2009.

[4].Wikipedia, "Cloud computing" http://en.wikipedia.org/wiki/Cloud_computing.

[5].I. Foster, "What is the grid?", Daily News And Information For The Global Grid Community.

[6].NIST,http://csrc.nist.gov/groups/SNS/cloudcomputing/.

[7].I. Foster, C. Kesselmann, "The Grid: Blueprint for a New Computing Infrastructure", Morgan Kaufmann Publishers, USA, 1999.

[8].M.L. Bote-Lorenzo, Y.A. Dimitriadis and E. Gómez-Sánchez, "Grid Characteristics and Uses: A Grid Definition. Grid Computing". (Ed.). Springer Berlin / Heidelberg, pp. 291-298, 2004.

[9].I. Foster, "Globus Toolkit Version 4: Software for Service- Oriented Systems. FIP International Conference on Network and Parallel Computing". Springer-Verlag LNCS 3779, pp. 2-13, 2005.

[10].I. Foster and C. Kesselman, "Globus: a Metacomputing Infrastructure Toolkit". International Journal Supercomputer Applications, Vol. 11, No. 2, pp.115–128, 1997.

[11].I. Foster, Y. Zhao, I. Raicu and S. Lu, "Cloud Computing and Grid Computing 360-Degree Compared", Proceedings of the IEEE Grid Computing Environments Workshop, pp. 1-10, 2008.

[12]. R. Buyya, D. Abramson and J. Giddy, "Nimrod/G: An Architecture for a Resource Management and Scheduling System in a Global Computational Grid", IEEE Intl. Conf. on High Performance Computing (HPC ASIA), 2000.