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A Review Paper on Evolution of Cloud Computing, its Approaches and Comparison with Grid Computing

First Author:- Mamta Chugh*, Second Author :- Mrs. Niyati Jain
M.tech Computer Science
Vaish College Of Engineering

Abstract- Cloud computing is the most recent announced technology that has been launched on the network world. Clouds are considered as a new generation of Grid computing. Clouds consist of data centres which are owned by the same institute. The homogeneity within each data centre in the infrastructure is the main feature for the cloud computing compared to grid computing. This paper provides a definition for the cloud, it discusses many aspects of Cloud Computing, and describes architectures for the cloud (by looking at Amazon's application (GrepTheWeb)) and how its cost definition differs from that of Grid computing. This paper focuses on comparing Cloud Computing to previous generations such as Grid Computing, by reviewing some Security and Policy Issues in Cloud and Grid Computing. At the end, this paper describes the similarities and differences between the Grid and Cloud approaches.

I. INTRODUCTION

The appearance of cloud computing has been observed very recently as a new promising paradigm that delivers IT services as computing utilities for companies, academic computing and enterprises. has caused an influence in IT industries According to IBM [6], a cloud is a pool of virtualized computer resources that hosts a variety of different workloads and allows them to be deployed and scaled-out through the rapid provisioning of virtual or physical machines; supports redundant, self recovering, highly scalable programming models and resource usage monitoring in real time to enable rebalancing of allocations when needed.

Cloud Computing Deployment Model This is a new model concept that can be divided into the following four famous models (but there might be other models that can be drawn from them

• Public: Services and resources are reachable to the public by using the internet. This environment emphasizes the advantages of rationalization (as a user has the ability to utilize only the needed services and pay only for their use), operational simplicity (as the system is organized and hosted by a third party) and scalability. The main concern in this type of cloud environment is the security; since this environment is accessible to the public and user data in one stage is hosted by a third party.
• Private: Services and resources are reachable within a private institute. This environment emphasizes the advantages of integration, optimization of hardware deals and scalability. The main concern is the complexity, as this environment is organized and hosted by internal resources. Security is not a main issue compared to the public cloud as the services are reachable only through private and internal networks.
• Community: Services and resources of this type are shared by various institutes with a common aim. It may be organized by one of the institutes or a third party
• Hybrid: This type combines the methods from the private and public clouds, where resources can be used either in a public or a private cloud environment [22]. The advantages and the concerns are a mixture of the earlier type. Another cloud technology which has become very popular recently is called Green Cloud Computing. Its aim is to reduce resource consumption and yet fulfill quality of service needed and hold the resources switched off as long as possible. "The advantages of such technology are lower heat production and power saving by employing server consolidation and virtualization technologies; since active resources (servers, network elements, and A/C units) that are idle lead to energy waste"

II. EVOLUTION OF CLOUD COMPUTING

It is contribution of some scientific research to develop a definition of the cloud computing and Youseff et al. were among the first person to provide understanding of cloud computing

and its components. They said that cloud computing is a "combination of some new and all old concepts in a lot research fields like Service-Oriented Architectures, grid and distributed computing and also virtualization. According to Youseff et al. "cloud computing can be considered a new computing paradigm that allows users to temporary utilize computing infrastructure over the network, supplied as a service by the cloud-provider at possibly one or more levels of abstraction" (Youseff et al. 2008). According to Armbrust et al. "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). The datacenter hardware and software is what we will call a Cloud. When a Cloud is made available in a pay-as-you-go manner to the general public, we call it a Public Cloud; the service being sold is Utility Computing. We use the term Private Cloud to refer to internal datacenters of a business or other organization, not made available to the general public. Thus, Cloud Computing is the sum of SaaS and Utility Computing, but does not include Private Clouds" (Armbrust et al. 2009). Rajleen Kaur et al, / (IJCSIT) International Journal of Computer Science and Information Technologies, Vol. 5 (5) , 2014, 6060-6063 www.ijcsit.com 6060 Cloud computing is that which does not compute on local computers but on centralized computers that are handled by another organization or computed by the third party and storage utilities but this is not done in Grid Computing.

III. DIFFERENT APPROACHES OF CLOUD COMPUTING

III.1 SOFTWARE AS A SERVICE (SAAS)

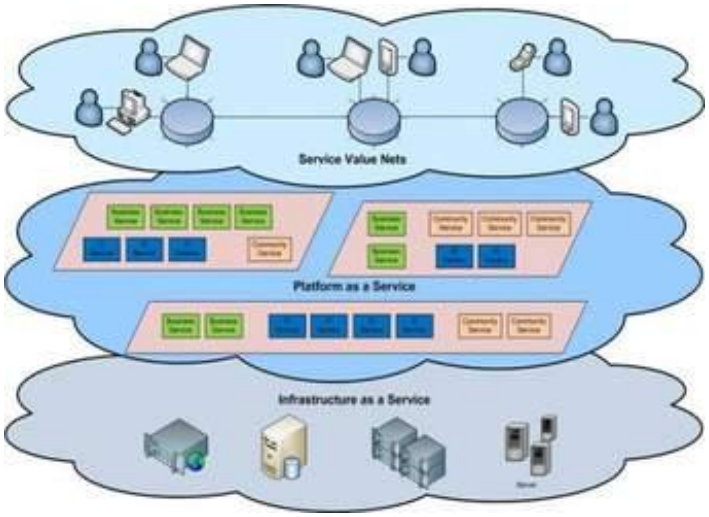
Saas is available for users through internet and browsers. Saas refers to Prebuilt functionally independent, vertically, integrated and universally available applications. Example an email system, human resource management, Payroll Processing, Database processing, and other application processes delivered to and used by customer as service. It can be divides into two models 1) Hosted application management model 2) Software on demand model.

III.2 PLATFORM AS A SERVICE (PAAS) In Pass the platform is given to the consumers and they deploy their own software , coding and application in the cloud . It approaches to software and development tools. For example: Application server (Java, .Net framework) and Database server (My sql ,oracle) which client will use to make their own applications to meet its specific needs . It creates web applications very easily and quickly on computing platform and it reduces the complexity, cost and maintenance of software.

III.3 INFRASTRUCTURE AS A SERVICE (IAAS) IaaS provides the delivery of computing resources in form of hardware, network, storage, operating system and storage devices as on demand service. IaaS is combination of both public and private infrastructure or can be obtained as individual. For IT resources IaaS will provide a new consumption model as compare to SaaS and PaaS the IaaS is growing rapidly

IV. CLOUD ARCHITECTURE

3.1 Overview of Cloud Computing could be comprised of several heterogeneous such as grids computing, cluster, super computers etc. (Figure 1). This aggregation is used by millions of users. Consider, for example the case of Microsoft's Live, where the system has around 300 million users. Added to this, there are almost 330.000 application developers of Amazon EC2. Cloud Architecture consists of software applications, which use Internet-accessible on-demand services. Therefore, these applications are considered as an essential computing infrastructure that is used when it is required (such as processing a user request) and to perform a specific job by giving up unwanted resources. Also drawing the needed resources on-demand (like compute servers or storage.



V. THE COST OF A CLOUD In this section the discussion focuses on cost models in some Components in Cloud architecture such as those in table2. The important question about the cost of cloud is Where does the cost go in today's cloud service data centres?.

Amortized Cost	Component	Sub-Components
~45%	Servers	CPU, memory, storage systems
~25%	Infrastructure	Power distribution and cooling
~15%	Network	Electrical utility costs
~15%	Network	Links, transit

VI. Security and Policy Issues in Cloud and Grid Computing

Cloud and grid computing technologies are used as inexpensive systems to gather and utilize computational capability together. These technologies try to improve jobs and application services by arranging machines and distributed resources in a single huge computational entity .Clouds mainly consist of data centres which are owned by the same institute. The homogeneity within each data centre in the infrastructure is the main feature for the cloud computing compared to grid computing. In this case, any conflict between a heterogeneous data centre and/or different administration domains can become a serious issue for cloud interoperability. It can be seen that the stages of anonymity and privacy provided by cloud to the external users will be less than the user of desktop in numerous situations. On the other side, grids was originally established on the idea that resources infrastructure are dynamic and heterogeneous in their nature. This means different organization with different administrative domains. This also means that security was taken into account from the beginning when the grid system was originally built. Presently, the security paradigm for clouds appears to be fairly less secure than the model in grids environment.

VII. CONCLUSION : In conclusion, cloud computing as mentioned above is a new technology of computer network, providing the web services in high quality and lower cost comparing to normal technique. Using cloud computing might contribute to improvement of services in other related technologies specially the previous generations such as Grid computing. Cloud computing is almost certainly set to be developed and become an attractive option for many corporations. The future of computing is set to be successful. It is the next generation and can provide tremendous value to companies. It can help companies achieve more efficient use of their IT hardware and software investments, which in turn can lead the acceleration and adoption of innovations.

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