Volume 3, Issue 7, July 2013 ISSN: 2277 128X
International Journal of Advanced Research in Computer Science and Software Engineering
Research Paper
Available online at: www.ijarcsse.com

Cloud Services Based on Resource Allocation

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Abstract— "CLOUD COMPUTING" is one of the emerging research area that is been used effectively at the industry level. One of the major contribution of cloud computing is to avail all the resources at one place in the form a cluster and to perform the resource allocation based on request performed by different users. We will define the user request in the form of requirement query. Cloud Computing devices being able to exchange data such as text files as well as business information with the help of internet. Technically, it is completely distinct from an infrared. Using a new models Iaas,Paas,Saas..The transmission and storage of large amounts of information, and become propulsion of fiber-optic accelerating towards 40G/100G. Its foreground is to provide secure, quick, convenient data storage and net computing service centered by internet. In this paper we consider about cloud computing, its introduction, its evalution,virtulization ,service delivery model,cloud deployment model, working and future development of cloud computing.

Keywords— Cloud Computing,SSOS,GUI,Cluster.

I. INTRODUCTION

Cloud computing is a construct that allows you to access applications that actually reside at a location other than your computer or other internet-connected device. It has become one of the most talked about technologies in recent times and has got lots of attention from media as well as analysts because of the oppurtunities it is offering[12]. Cloud computing is combination of two terms: Cloud & Computing. Cloud is the Network. A network is a bulk of thousands of users. These users may or may not be connected. If they are connected, there will be one of model formed (IaaS, PaaS, SaaS), discussed further. The cloud also consists of Server & a Database.

The US National Institute of Standards and Technology (NIST) has developed a working definition that covers the commonly agreed aspects of cloud computing. The NIST working definition summarises cloud computing as[11]:

"a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction." This definition describes cloud computing as having five essential characteristics, three service models, and four deployment models.

The essential characteristics are:

1) On-demand self-service
2) Broad network access
3) Resource pooling
4) Rapid elasticity
5) Measured service

II. Evolution of Cloud Computing

Cloud computing means different to different people, its benefits are different to different people. To IT managers, it means to minimize capital-expenditure by outsourcing most of the hardware and software resources. To ISVs, it means to reach out to more users by offering a SaaS solution. To end users, it means to access an application from anywhere using any device. The following diagram illustrates a high level overview.

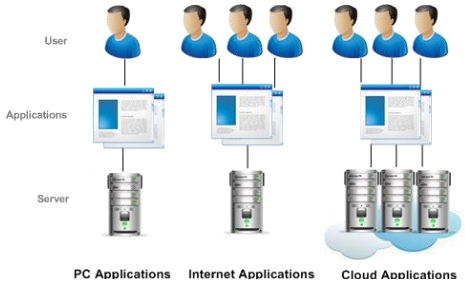

Fig 1 : Evaluation of Clouds[5]

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In the beginning of the computing era, the relationship between the user and the machine was one-to-one.. In the Internet era, the relationship between the user and the machine was many-to-one. Many users could access applications running on one machine. In cloud computing, the relationship between the user and machine are many-to-many. Now, what was theres on of this evolution? What were the driving factors behind this?

The reason for the evolution from PC-based application to Internet-based application was obvious. This happened because of the need of multiple users trying to access an application from their own machines.

III. Virtualization

In computing, virtualization is the creation of a virtual (rather than actual) version of something, such as a hardware platform, operating system (OS), storage device, or network resources. While a physical computer in the classical sense is clearly a complete and actual machine, both subjectively (from the user's point of view) and objectively (from the hardware system administrator's point of view), a virtual machine is subjectively a complete machine (or very close), but objectively merely a set of files and running programs on an actual, physical machine (which the user need not necessarily be aware of).

IV. Cloud Computing Service Delivery Models

Cloud computing systems generally falls into three course grain categories. Infrastructure as a service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS).

Many companies are offering services.[9]

1) Infrastructure as a Service(IaaS)

Infrastructure as a Service (IaaS) provisions hardware, software, and equipments to deliver software application environments with a resource usage-based pricing model. Infrastructure can scale up and down dynamically based on application resource needs.Typical examples are Amazon EC2 (Elastic Cloud Computing) Service and S3 (Simple StorageService) where compute and storage infrastructures are open to public access with a utility pricing model.

2) Platform as a Service(PaaS)

Platform as a Service(PaaS) offers a high-level integrated environment to build, test, and deploycustom applications. PGenerally, developers will need to accept some restrictions on the type ofsoftware they can write in exchange for built-in application scalability.An example is Google's App Engine.

3) Software as a Service (SaaS)

User buys a Subscription to some software product, but some or all of the data and codes resides remotely. Delivers special-purpose software that is remotely accessible by consumers through the Internetwith a usage-based pricing model.

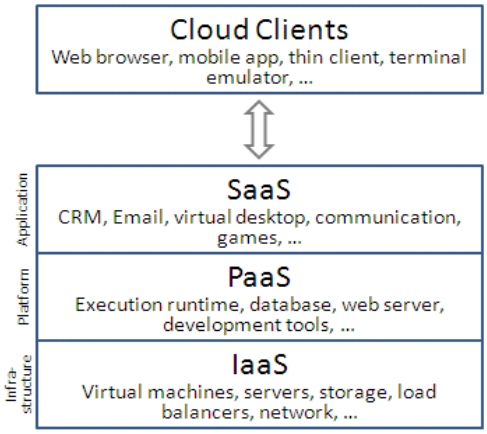

Fig 2 :Cloud Service Model [9]

In this model, applications could run entirely on the network, with the user interface living on a thin client. Salesforce is an industry leader in providing online CRM (Customer Relationship Management)Services. Live Mesh from Microsoft allows files and folders to be shared and synchronized across multiple devices.

V. Cloud Deployment Model

A. Public cloud

Public cloud realizes the key concept of sharing the services and infrastructure provided by an off-site, third-party service provider in a multi-tenant environment.

B. Community cloud

Community cloud is shared by several organizations and is supported by a specific community that has shared interests and concerns[1] (security, compliance, jurisdiction, etc.), whether managed internally or by a third-party and hosted internally or externally.

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C. Hybrid cloud

Hybrid cloud is a composition of two or more clouds (private, community or public) that remain unique entities but are bound together, offering the benefits of multiple deployment models.[1]

D. Private cloud

Private cloud entails sharing services and infra- structure provided by an organization or its specified service provider in a single-tenant environment. Enterprises' mission- critical and core-business applications are often kept in a private cloud.[1]

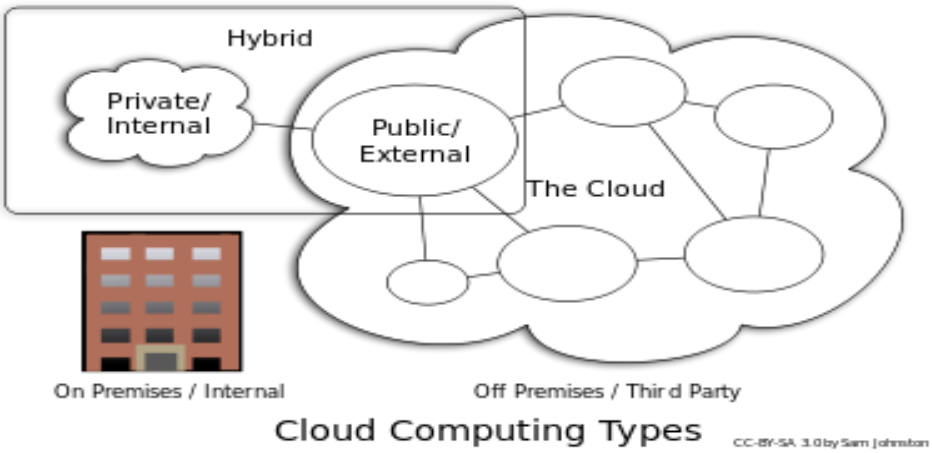
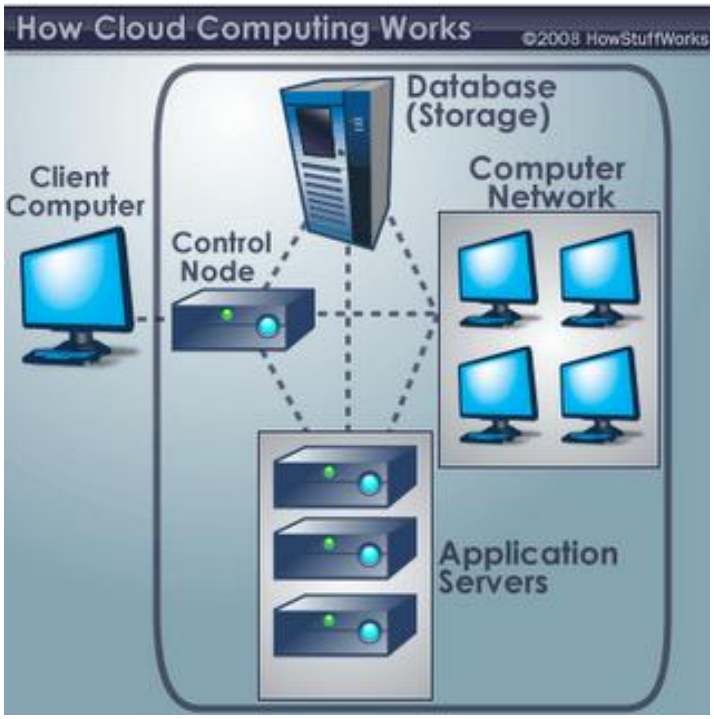


Fig 3: Type of Cloud computing [1]

VI. HOW CLOUD COMPUTING WORKS?

There are an increasing number of Cloud Services available in the Internet. Cloud services can be a component of a system and different Cloud Servers that would provide different services. In this present work we have defined a multiple cloud environment. Each cloud server is defined with certain limits in terms of memory and the cpu specifications. Now as the users enter to the system, the user request is performed in terms of processes. To represent the parallel user requests, n number of requests are been generated by the users. All these requests are to be handled by the cloud servers in parallel by using the multiple cloud concept. A middle layer is defined between the cloud servers and the client requests that will perform the allocation of the processes to different clouds in underload and over load conditions. These parameters are the process time, deadline, input output specifications etc. In the general case, the allocation of the processes are performed in a sequential order. Each process must be executed within the deadline limit. But if more than one processes occur at same time and not get executed before the deadline, in such case the processes is switched from to other called the process migration.



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VII. GRAPHICAL USER INTERFACE

To present the work effectively and to accept the user input, a graphical interface is presented in this work in matlab language. The graphical user is here to accept the input parameters related to the clouds as well as to define the number of users. The graphical screen of this work is shown in figure 4.1.

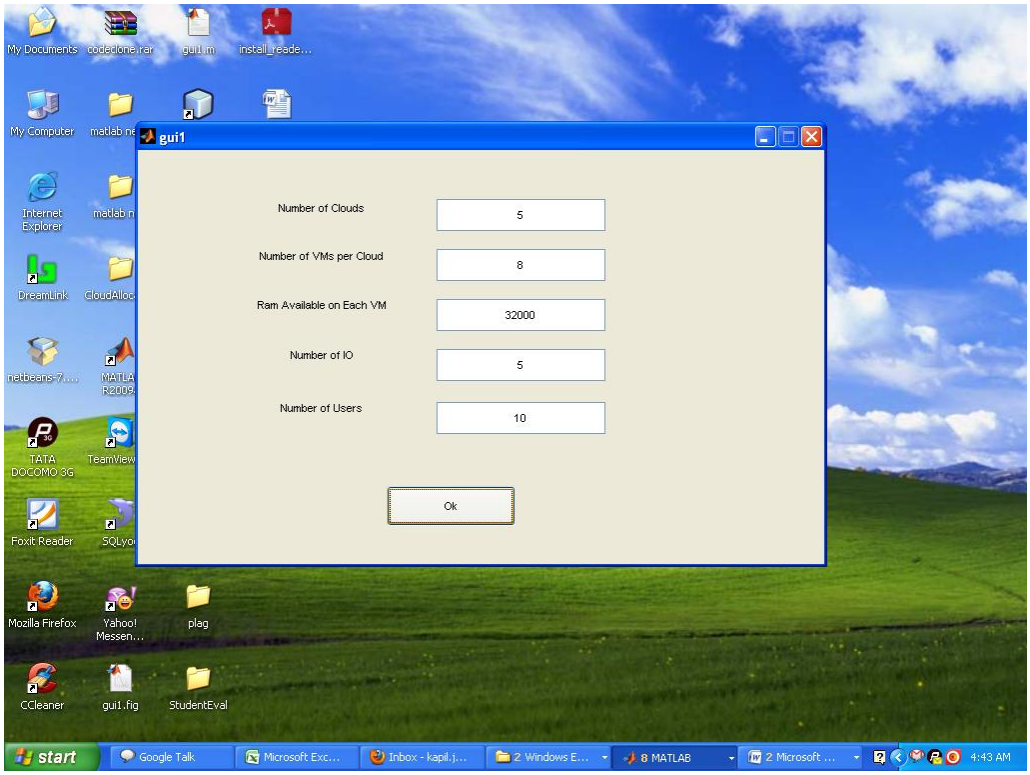

Figure 3.1 : Graphical Interface

A1As shown in figure 4.1,a graphical interface is presented to accept the main input parameters to build the cloud environment and to input the user requirement. The input taken here includes the number of clouds in the environment number of VMs supported by each cloud, memory availability, IO availability for each virtual machine

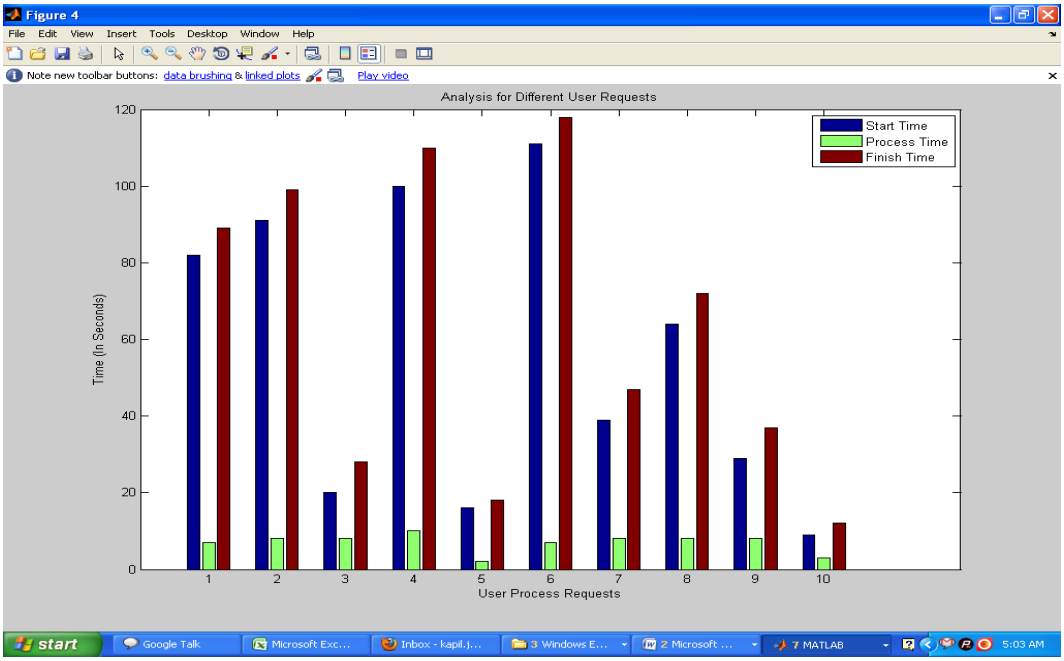

Fig 3.2 : Process Analysis Figure

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Here figure 4.5, is showing the Process analysis for all 10 processes. Here x axis represents the number of user requests and y axis represents the time taken by these process in seconds for all three parameters called process time, finish time and the start time.. The figure is showing the these three vectors collective

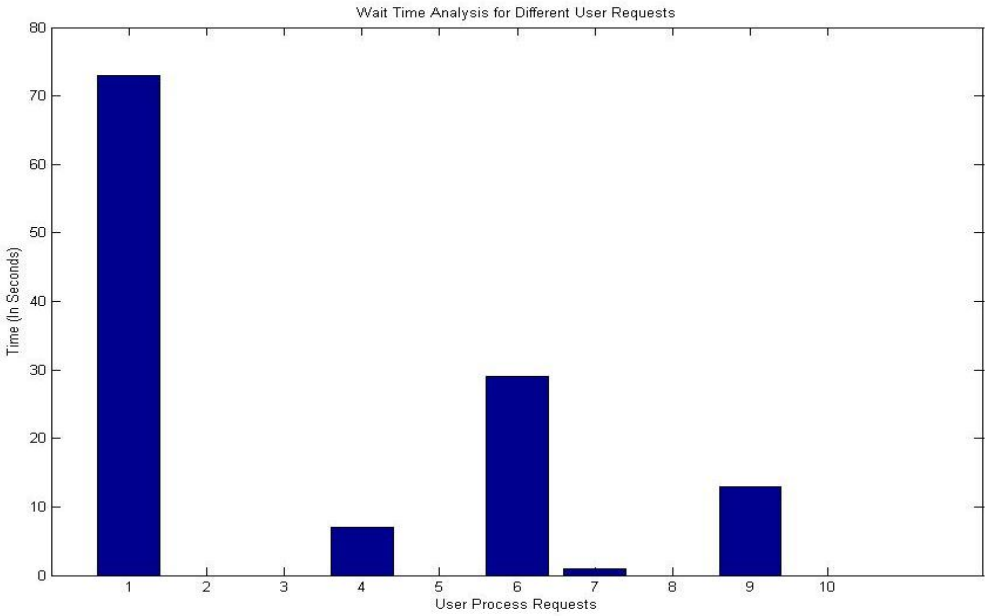

Fig 3.3Wait Time Analysis

The figure is showing the wait time of each process. As we can see, most the processes are executed without any wait. And some are having the nominal wait time.

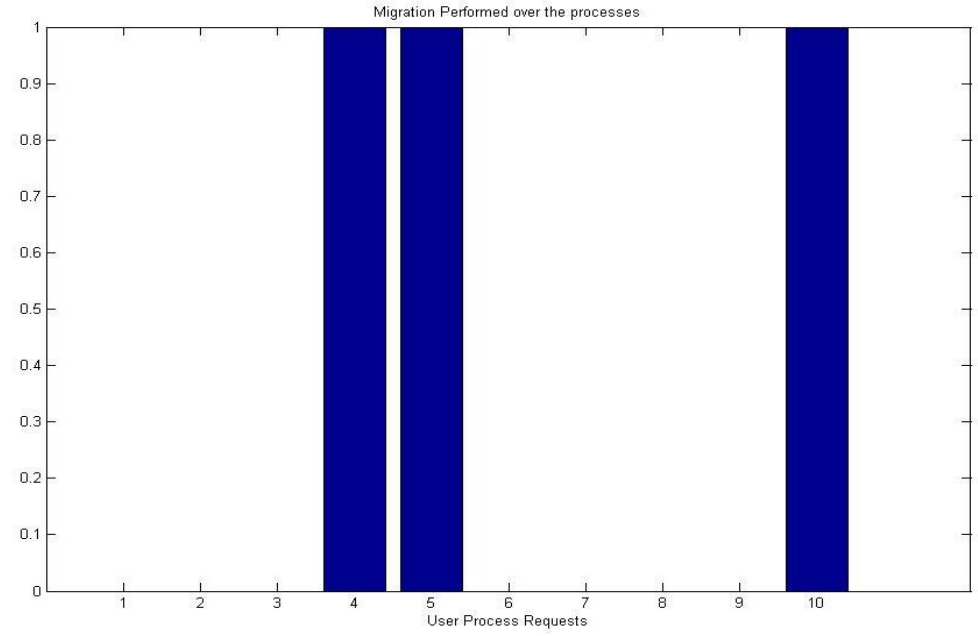

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Fig : 3.4 : Migrated Processes

Here figure 4.6 is showing the list of migrated processes over the work. As we can see, three processes 4,5 and 10 get migrated over the work.

VIII. FUTURE DEVELOPMENT

The presented work is about to perform the scheduling and the allocation of the processes to the clouds in case of under load and overload conditions. In case of over load condition, the migration ofthe processes is performed from one cloud to other. The Future enhancement of the work are possible in the following directions

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1) The presented work is defined the overload conditions in terms of deadline as well as the memory limit of the clouds.
2) In future some other parameters can also be taken to decide the migration condition.

IX. Conclusion

In this present work, a resource allocation scheme on multiple clouds in both the under load and the over load conditions. As the request is performed by the user, certain parameters are defined with each user request, these parameters includes the arrival time, process time, deadline and the input output requirement of the processes The virtual machines are here to perform the actual allocation. These are defined with certain limits in terms of memory, load etc. If the allocated process cannot be executed in its required time slot, in such case the migration of the process is required. The migration of the processes is here defined in case of overload conditions. The analysis of the work is done in terms of wait time, process time of the processes. The obtain results shows the successful execution of all the processes within time limit. The work is performed on a generic system that can have n number of clouds.

ACKNOWLEDGEMENT

It is a great pleasure for me to record my deep sense of gratitude and appreciation to Ms Alankrita, the Paper supervisor for his valuable guidance, keen interest, encouragement and friendly discussion during the paper of the present research work. He has guided my endeavors and encouraged me to explore the joys of learning.

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