Cloneable Agent in Cloud Computing

Fazle Mateen[1], Apurva Soni[2],Shantanu Varshney[3]*
BACHELOR OF COMPUTER APPLICATION
SURESH GYAN VIHAR UNIVERSITY

Abstract:- Cloud Computing is a technology that has brought revolution in the field of computing and developed a major trend in IT. It is a technique where we have the access to our data and application from anywhere in the world with an internet access. The data and applications lie remotely on the central remote server. In other terms it is a technique of delivering the services using internet.
The beauty of cloud computing is that some other company hosts our application which means they handle the cost of servers, manage the software updates and depending on the usage of the service we pay for the service.
In this paper we will discuss about the problems we face regarding the security issues, data integrity, economical constraints, and balancing the traffic over the network, in the case of cloud computing.

I. Introduction

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). And cloud computing is an example of the vision he had where the computing services are available on demand. The consumer (Computing service user) can access the service related to computer, whether it is a software or hardware or infrastructure, and pay for the duration he accessed the services, that is, "Pay as per Usage". With this technology, the consumers don't have to invest heavily or find difficulties in setting up and maintaining the complex IT Infrastructure. The name, cloud, is given due to the involvement of internet which is a metaphor of internet. The benefit of cloud computing is that it eliminates the cost and complexity of buying, configuring and managing all the hardware and software needed for the application. Now, anyone with an internet connection can build powerful applications with the services provided by Cloud Computing.Cloud Computing infrastructure allows users to use IT hardware and software in a better way. It increases the profitability by improving resource utilization. Sharing of resources from large pool of cloud brings down cost and increases utilization by delivering resources only for as long as those resources are needed.

II. Components of Cloud

In a simple sense, a Cloud Computing solution is made of several components: clients, datacenters and distributed servers. Each element has a purpose and plays a specific role in delivering a functional cloud based application.

- Clients: Clients play the same role as in everyday local area network (LAN).They are the devices that the end users interact with to manage their information on cloud.

- Datacenters: is the collection of servers where the application we are using is installed.

- Distributed Servers: The servers don't have to be housed at the same location, but located at geographically dispersed locations all over the world. This will help in a way that if something goes off at one site, causing a failure, the service could be accessed from another site.

III. Current Scenario

Simply defined, 'Cloud Computing' is the concept of providing services viz. shared resources (Infrastructure and Platform), software, and information over the Internet to users on demand. The benefits of this technology can be counted in terms of the following points:

- Reduced Cost
- Increased Storage
- Highly Automated
- Flexibility
- More Mobility.

With the use of Cloud Computing services, there are ever present certain risks. The risks may involve from the perspective of both –Customer and Vendor. Some of the concerns raised with respect to the customers are:

Data Security since the data is stored and accessed via the Internet.

The next problem of cloud computing is the Problem of failure of service with Internet Service Provider which may be a rare problem, but we may not be able to access our applications. This problem has happened in July 2008 with Amazon's S3 cloud storage service which went down for eight hours for the second time and the services provided by them were not been accessed until the engineers were able to fix the problem. Another problem we may face is Application Integration Issues. It may be difficult to integrate the applications which are geographically dispersed. For example, it is always been easier for two applications to exchange information when residing at the same place, rather than residing on the cloud, which is more prone to failure.

Load-balancing is another problem with Cloud Computing. Since Cloud Computing providers have set up several datacenters at different geographical locations to serve needs of their customers all over the world, the existing systems do not provide the mechanisms and policies for dynamically coordinating load balancing between the cloud based data centers for providing QoS.

Beside the above discussed issues, we may encounter a problem, Increased Number of Service Provider, from customer's perspective which can be stated as follows:

In just a few short years, cloud computing has become a technology that affects everyone's daily lives. Our personal files are stored in cloud. Even we are maintaining our friendships via applications in cloud running on mobile phones and tablets. This being the fastest growing part of IT, cloud computing has tremendous benefits to consumers of all size. But none of this is happening on its own. It's all being figured out by the companies building clouds. The number of services available on cloud is increasing day by day there by increasing the number of service providers in the market.

As discussed in Literature Review, initially salesforce.com was the first company to put the milestone in this field in 1999, followed by Amazone in 2002. And today, companies are rushing to develop new technologies to speed cloud development. Many leading companies like IBM, Google, Yahoo, HP etc. have also taken initiatives. With this rapid growth, the list of Service providers is expected to grow rapidly by 2014.

IV. The Problem and the proposed Solution

Once the consumer has decided to move to a cloud, the next most important decision is to choose the right cloud computing service provider from the number of existing service providers. This is the most complex area faced when managing the cloud as there are scores of service providers to choose from.

There are many services available in the cloud which are broadly categorized into 3 categories. And we need to find a platform where all the services irrespective of the service provider and irrespective of the category (the three categories) it is belonging to, we should have access to the services we have requested for. To this problem, we can find a solution that will help a user/client to retrieve the different service providers and the services provided by them with an optimization (choosing the best element from some set of available alternatives.). For doing this we may think of some solution that can gather the requested information and process them (i.e. selection of service providers, selection of optimized services).

Suppose a client/user has requested for a service. There are many service providers who are providing that particular service requested by the client and all are working on their own set of rules. So first of all we have to think of a solution (a process) that will work on a common platform/common interface. The next problem comes of retrieving all service providers providing that particular requested service. For that our process should maintain an index between the services and

their corresponding service provider. This indexing has to be refreshed from time to time. Once the process gets the list of services it should check those services for optimization in terms of access time, in terms of cost, in terms of security. Once the required request is matched, the process must set up a connection between the client and the service provider for the exchange of services. So the solution to the problem discussed needs an automated process which is capable enough to do all the things.

When the links require complex, dynamic binding and are subject to rapid change, agent-based approaches should be considered. We can think of an automated process - an AGENT that does the mapping between the requirements of the user and the service providers. The idea of using agent has been discussed in. Our agent will retrieve all the service providers available on internet, select the services and optimize the services on the basis of access time or on the basis of cost.

V. Methodology

The idea to conduct this research is to manage the cloud computing services with the help of a system which is capable of intelligent behavior. We propose a MULTI-AGENT SYSTEM integrated with Cloud that makes it more flexible, autonomous and results in high performance. This system is a special software component that has the ability to act independently on user behalf without any interference. The prototype of this system has two roles: service provider and customer. The goal is to design a system (software) that provides the customer with an application program interface (API) and graphical user interface (GUI) that hides any complexity and allow the customers to select the best suited service provider for their requirements. The architecture of this system has two layers: application layer and Internet layer.

The application layer contains all the applications such as agent generation, agent management, retrieval of data by agent and optimize the retrieved data and provides decision support.

The system provides all the services to customer through a standard interface.

The Internet layer is the layer from where the required data, fulfilling the needs of the cloud user, is being retrieved.

The whole system will be simulated with the help of a high level language (HLL).

VI. Conclusion

The proposal suggests an AGENT for cloud computing services that retrieves the optimized services for the computing service user.
In today's scenario there might be very few service providers for cloud computing and there might be very few services provided by them. But what if the service providers and the services will increase in future? It would be difficult to find the optimized services on our own. So we require some kind of automated procedure that will take care of the things no matter how many service providers are there and how many services they are providing.

VII. References
[1] Michael Armbrust, Armando Fox, Rean Griffith, Anthony D. Joseph, Randy Katz, Andy Konwinski, Gunho Lee, David Patterson, Ariel Rabkin, Ion Stoica, and Matei Zaharia. Above the Clouds: A Berkeley View of Cloud Computing. Technical Report 2009, Electrical Engineering And Computer Science, College of Engineering, UC Berkeley(EECS-2009-28).

[2] Domenico Talia. Cloud Computing and Software Agents: Towards Cloud Intelligent Services, in proceedings of 12th Workshop on Objects and Agents (WOA-2011), Renede(CS) Italy, July 4-6, 2011, Vol. 741, pp 2-6.

[3] J. Octavio Gutierrez-Garcia and Kwang-Mong Sim. Self-Organizing Agents for Service Composition in Cloud Computing. In Proceedings of the 2010 IEEE Second International Conference on Cloud Computing Technology and Science (CLOUDCOM '10), pp 59-66, Nov 30 – Dec 3, 2010.

[4] Dinesh Kumar R C, Ashwin R. Multi-Agent based Cloud Services. International Journal of Computer Applications(IJCA)Proceedings on E-Governance and Cloud Computing Services – 2012, Vol. EGOV – Number 1, pp 7-10, ISBN 973-93-80870-67-9.

[5]Rajkumar Buyya, Rajiv Ranjan, Rodrigo N. Calheiros. Inter Cloud: Utility-Oriented Federation of Cloud Computing Environments for Scaling of Application Services. In the proceedings of the 10th International Conference on Algorithms and Architectures for Parallel Processing (ICA3PP 2010, Busan, South Korea, May 21-23, 2010), LNCS, Springer, Germany, 2010.

[6] Fabio Bellifemine, Agostino Poggi, Giovanni Rimassa. JADE – A FIPA-compliant agent framework. 1999

[7]Aarti Singh, Manisha Malhotra. Agent Based Framework for Scalability in Cloud Computing. International Journal of Computer Science and Engineering Technology (IJCSET), vol3, issue 4, April 2012 pp 41-45, ISSN 2229-3345.