A Cloud Computing Collaborative Architecture Model

Ali Bagherinia [1], Sohrab Hojjatkhah [2] , Ali Jouharpoor [3] and Akbar Bemana [4]

[1] Islamic Azad university- Dehdast branch

[2] Islamic Azad university- Dehdast branch

[3] Islamic Azad university- Dehdast branch

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[4] Islamic Azad university- Dehdast branch

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Abstract

This research work present a model to execute long computational and other service in cloud computing that couldn't be executing in single computer system alone. While in all other existing cloud computing model users must pay cost for using cloud services this model is based on collaborative between each using system with other systems that they need to other services.

Keywords: *Cloud Computing, Resource sharing, Collaborative.*

1. Introduction

Due to the epidemic success of internet and distribution of resource computing in last few years, internet realized a new concept called cloud commuting.

Cloud computing is complete new technique put forward from industry circle, it is the development of parallel computing, distributed computing and grid computing, and is the combination and evolution of virtualization, utility computing, Infrastructure-as-a-Service (IaaS), Platform-as-a- Service (PaaS) and Software-as-a-Service (SaaS) [1-8]. To users, cloud computing is a Pay-per-Use-On-Demand mode that can conveniently access shared IT resources through internet.

Cloud computing environment causes traditional service providers to have two different ways. These are service providers and infrastructure providers. On the other hand in Cloud computing a end user uses a service as shown in Fig. 1. Although I propose another way that I discuss it in section 3.

Business and industry owners are attracted to Cloud computing concept due to many features [9, 10]. These features are as follows:

- Lower initial investment
- Easier to manage
- Scalability
- Deploy faster
- Location independent
- Device independent
- Reliability and Security

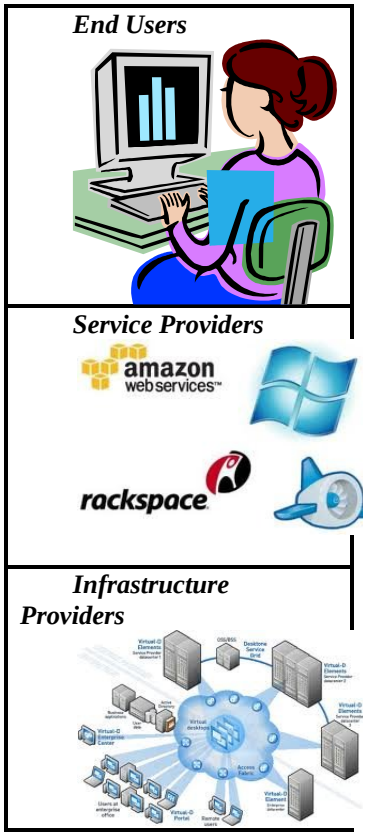

Fig. 1 providing service in cloud computing.

Cloud computing is a traditional manner for using resources and IT services such as processing power, main memory, storage, band width and software via sharing technique.

Cloud computing as simplest, is a collection of computing software and services available from a decentralized network of servers [10].

A proverb is "if you need milk isn't necessary to buy a cow" describe cloud computing. Means if you need a

service (milk), don't you buy all resource (a cow) to provide the service.

Then instead of buying, installing and maintaining physical infrastructure and software, that you spent much money, particularly in cases that you don't need to them continuously, you can using other person resources.

Cloud computing is typically classified in two ways [11]: 1. Location based classification. 2. Type of services based classification. Cloud computing via location is usually classified in the following types: public cloud, private cloud and hybrid cloud [1, 12]. Where private cloud 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 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 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. Base upon the services that they offer they are classified in the following types: Infrastructure as a service (IaaS), platform as a service (PaaS), and software as a service (SaaS) where IaaS is the most basic and each higher model abstracts from the details of the lower models [13].

2. Related Work

Existing cloud computing model are Hadop MapReduce [14] and a general architecture was discussed in [15] . MapReduce[14] is a software framework introduced by Google to support distributed computing on large data sets on clusters of computers. HTTP-based applications are usually conform to some web application framework such as Java EE. MapReduce consists of one Master to which client applications submit MapReduce jobs. The Master pushes work out to available task nodes in the data centre striving to keep the tasks as close to the data as possible. The open source Hadoop MapReduce project [16] is inspired by Google's work. Currently, many organizations are using Hadoop MapReduce to run large data intensive computations.

Other architecture is shown in Fig. 2. This architecture represents the culture of cloud and access procedure of the cloud server. Virtualization is the key mechanism, it could be used to increase the server utilization as much the computing power available to the server, e.g. to better match the overall workload. The architecture provides a front end interface such as a Portal that allows a user to select a service from a catalogue. The user request is passed to the system management, finds the correct resources and then calls the provisioning services which allocate resources in the Cloud. The provisioning service may deploy the requested software stack or application as well, e.g. via licensing on-demand [15].

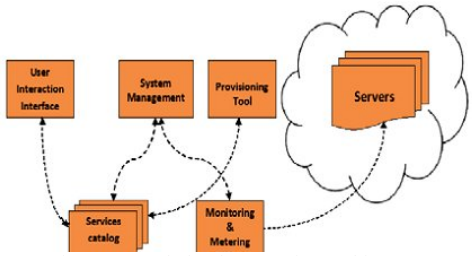

Fig. 2 General cloud computing architecture

3. Proposed Model

This model is based on collaborating of users that have number resources and need to other resources. This model is suitable for heavy processing computing that they couldn't execute in a single personal computer alone. This model particularly is suitable for poor users (poor researchers), students; on the other hands is a cloud computing charity model.

In this model person resource subscribing is done via internet. This model is shown in Fig. 3.

As shown in Fig. 3. This model is described as follows:

1. Each user (client) does resource registering via internet.
2. Subscribed nodes pushed in a queue according to their hardware, OS, software and other abilities (this step is done by Resource Classifier).
3. Computing requests from users is received and classified according to:
   3.1. their necessary platform
   3.2. Their necessary software for running them.
   3.3. Their location

And they are pushed in a suitable queue (this step is done by Task Receiver and Task Classifier).

4. Tasks (computing requests) is allocated to nodes (registered resources in the step 1.) according to resource queue and physically network condition such as distance, etc. that is a overlay network aware of its infrastructure network.

In this model running tasks in the cloud computing is done without exchanging any funds. Because in this model each service requester must gives its resources or services to other users that they need to them. On the other this model is based on "tit-for- tat" policy. If a user request a resource/service prevents from giving her/his

resources/services to others, others avoid from giving resource/service to him/his. O the other hands this is a service- by- service model.
In this model queues are organized as DHT.

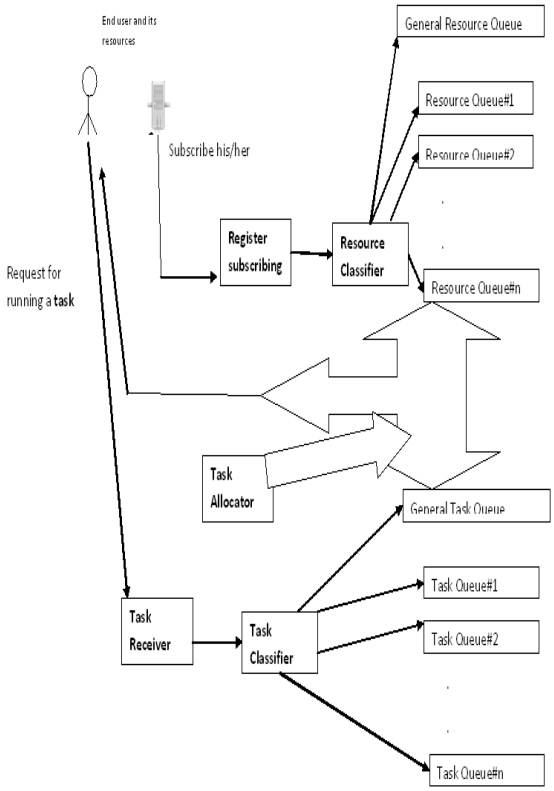

Fig. 3 proposed cloud computing model.

4. Comparison and Conclusion

In the existing models such as they were discussed in section 2. End users send their requests to servers. These models are client/server model. In these models virtualization is necessary. If end users are far from server (often) there is decreasing in performance. Even is possible that cloud services provider companies aren't easily accessible for many of the end users. While in the proposed model because task allocating is done based on its distance from resource and aware of infrastructure network) performance is better than existing models. In proposed model all members share their resource/services then users easily access to resource/services.
In other models virtualization is necessary, because there is difference between end user platform and server platforms. In contrast proposed model doesn't need to virtualization because tasks are allocated to resources according to appropriate platforms.

The most important point is in the other models the users must pay some money (cost) that providing this cost is impossible for some users particularly students, poor researchers. On the other hands they couldn't pay such cost. But in the proposed model by using "service- by- service" policy users can use others resource/services without paying no cost.

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